PRIL 27, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

LOS ALAMOS SCIENTIFIC LABORATORY
LIBRARY
29 1953

A PROGRAM FOR MANAGEMENT

No. 3 of a Management Series . . .

Magnify Your Profit through Research . . .

Basic and product planning must be conducted at the policy-making level to make program effective — p. 55

CONTENTS — PAGE 5

GOOD
EQUIPMENT
BRINGS
DOWN
PRODUCTION
COSTS

continuous coating lines

The application of galvanizing, terne and other coatings continuously in coils has arrived. Aetna's engineers and the steel industry's own specialists have worked closely in developing continuous coating. Use this experience and practical knowledge when you consider Continuous Coating Lines for your business.

In recent months, Aetna-Standard has completed four new galvanizing and terne lines for important steel companies. These installations include primary and auxiliary equipment.

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna•Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — G
Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, N
ern and Southern Rhodesia.
Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.
M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South Ame
Societe de Constructions de Montbard, Paris, France — France, Belgium,
land, Luxembourg, Switzerland.
Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Y
slavia, Greece, Turkey, Egypt.
Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.
Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.
Hale & Kullgren, Inc., Akron, Ohio — Representative for the Rubber Indu

Designers and Builders to the Ferrous, Non-Ferrous, Leather and Rubber Industries

Steelwork goes up faster with High-Strength Bolts

To put up steelwork quickly, more and more erectors are using Bethlehem High-Strength Bolts to join the structural members.

Bethlehem High-Strength Bolts save construction time because they can be installed with little effort. They are used with heavy semi-finished nuts, drawn up with power wrenches to make a secure joint.

To assemble Bethlehem High-Strength Bolts, two hardened steel washers are used with each bolt, one under the head, the other under the nut. This permits the development of maximum clamping force to resist slippage without deforming the connected material.

Bethlehem High-Strength Bolts are used in place of field-driven rivets. They are made at our fasteners plant at Lebanon, Pa., and are carefully heat-treated by quenching and tempering, to meet the requirements of ASTM Specification A-325. They are stocked in a wide range of sizes.

A letter or postcard to the nearest Bethlehem sales office will bring you a copy of our informative booklet, "High-Strength Bolting for Structural Joints," by return mail.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

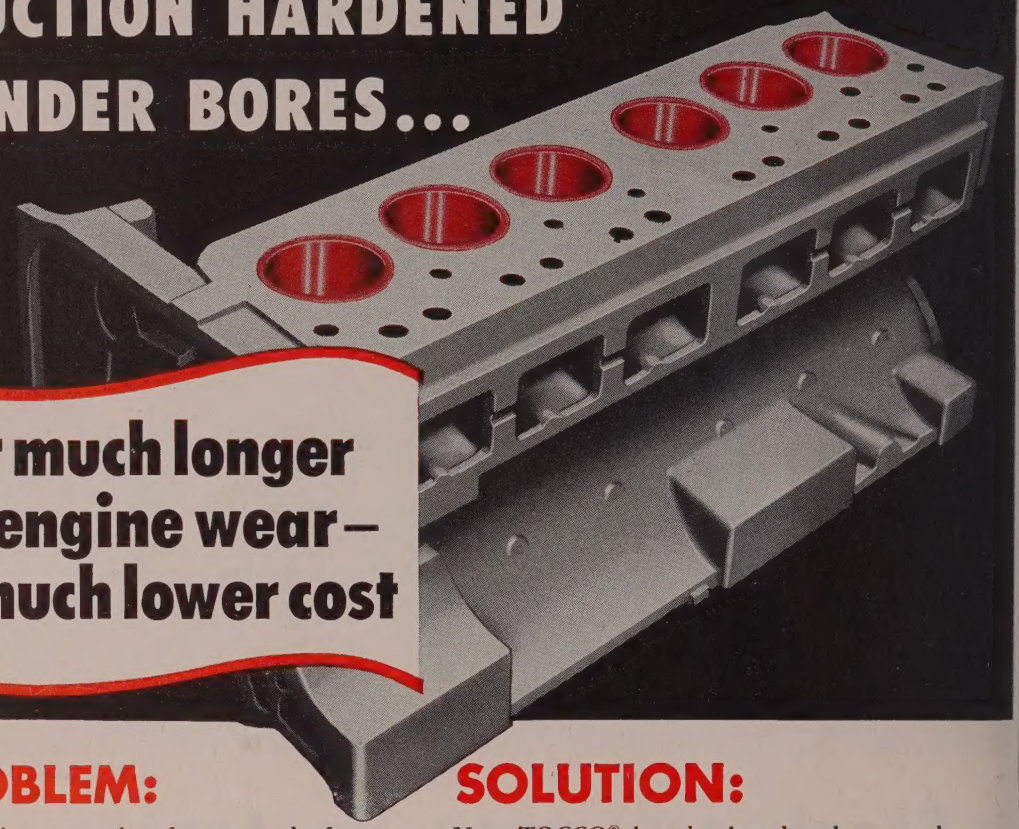
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Bethlehem supplies every type of Fastener

Another TOCCO® *First!*

INDUCTION HARDENED CYLINDER BORES...



for much longer engine wear— at much lower cost

PROBLEM:

Cylinder liners cost a lot of money, and, of course, they take up space that could be used for generating extra horsepower.

As a result engine builders, hoping to abolish the need for liners, experimented with various hard alloy irons that can furnish desired hardness in the cylinder bores.

However, these hard castings were extremely difficult to machine, and they cost several dollars per casting extra.

SOLUTION:

Now TOCCO® has developed and patented a process for Induction-hardening the cylinder bores of conventional, cylinder-iron castings. The blocks are easy to machine, yet cylinder bores are very hard to a depth of about 1/16". This depth of hardness permits several re-honings with no loss of hardness in the cylinder bore.

The cost?—less than half the extra cost of alloy iron cylinder blocks.

This important development is typical of the way TOCCO works hand-in-glove with the Metal Working Industry to improve products and lower costs.

see our catalog in MACHINE TOOL CATALOGS or write for copy

THE OHIO CRANKSHAFT COMPANY

TOCCO

*Trade Mark Reg. U. S. Pat. Off.

NEW **FREE** BULLETIN

Mail Coupon Today

THE OHIO CRANKSHAFT CO.
Dept. S-4, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating"

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

OSBORN

BEFORE: Closeup of helical gear before deburring.

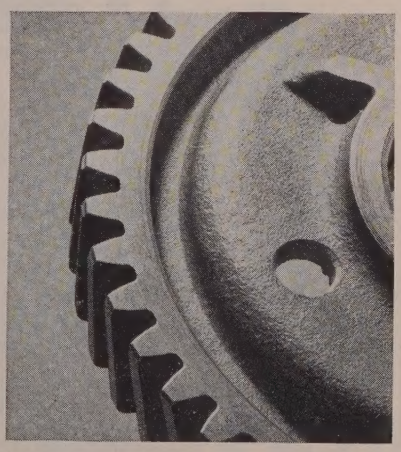
Gone . . . costly thorns in their side

Burr removal by muscle methods is aggravating because it is costly, inefficient and non-uniform in quality. Here's how a truck manufacturer has banished these "thorns in the side" with push-button brushing.

The operation: to deburr, break and blend the flank edges of gear teeth prior to shaving and heat treating. Formerly done with a hand tool, in several operations, the work was tedious and required close inspection and reworking to meet rigid specifications.

Now, an Osborn Brushing Machine in one speedy operation smooths the entire tooth edge . . . produces *uniform blending* of surface junctures of *every tooth*. Result: lower costs and greater precision for *better performance* of the product in service.

Find out how *you* can cut your costs and improve *your* products with power brushing. Call the nearby **O**sborn **B**rushing **A**nalyst or write *The Osborn Manufacturing Company, Dept. G-5, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



AFTER deburring with Osborn Brushing Machine.

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

THERE'S A TOUCH OF TENNESSEE IN FOUNDRIES

In gray iron and steel foundries producing the world's varied requirements of castings, look for products from TENNESSEE. Ferro alloys in briquettes and granulated form to improve metal properties and insure quality castings . . . Tenn-Sil foundry sand additive to reduce molding defects, to lower gas volume and to free sand of carbon... low-phosphorous pig iron to make special steels and iron . . . all supplied by TENNESSEE for faster and more efficient foundry operation and higher quality foundry products.

The many other basic materials from TENNESSEE are used by key industries everywhere. That's why TENNESSEE is known as an industry serving all industry.

TENNESSEE
PRODUCTS & CHEMICAL
Corporation
NASHVILLE, TENNESSEE

Producers of: FUELS • METALLURGICAL PRODUCTS • TENSULATE BUILDING PRODUCTS • AROMATIC CHEMICALS WOOD CHEMICALS • AGRICULTURAL CHEMICALS

This Week in Metalworking

STEEL

Vol. 132 No. 17 Apr. 27, 1953

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

✓ **Metalworking Outlook** 39

As the Editor Views the News 43
Editor-in-Chief E. L. Shaner views and reviews some significant political and industrial developments

Windows of Washington 64

Mirrors of Motordom 69
Detroit Editor Floyd G. Lawrence comments on what's new in metalworking's biggest market

The Business Trend 73

Men of Industry 77

✓ **Production-Engineering News at a Glance** 99

Roller Hearth Furnaces Toughen Tank Feet 100
Continuous flow of tank tracks is brazed and hardened on its trip through this automatic furnace

New Wrinkle in Stretch Wrap Forming 102
Gripping jaws that can be set to any desired contour open new possibilities in this field

Extrusion Goes Commercial 106
Steel shapes from the Koldflo process, most of which have been going to military, are moving into civilian jobs

New Products and Equipment 111

Progress in Steelmaking 130
Reuse Waste Pickling Liquors—Hydrogen chloride regenerates it in this new answer to an old problem

Modern Construction Uses Old Ideas 140
Expanded metal is nothing new but without modern production tools there wouldn't be enough for current demand

✓ **The Market Outlook** 157
Metal Prices and Composites begin on Page 158

Metal Market 160

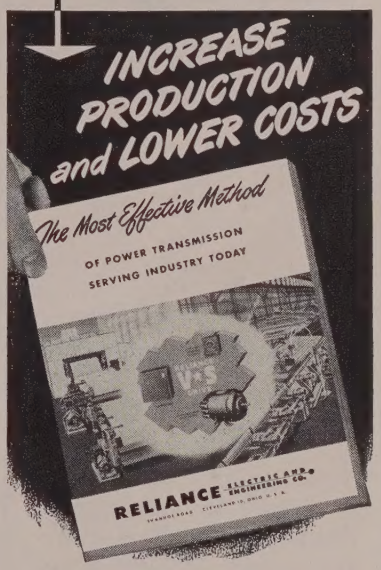
Behind the Scenes	6	Foreign News	63
Letters to the Editors	10	Obituaries	80
Checklist on Controls	53	Helpful Literature	115
Subcontract Summary	53	Calender of Meetings	128

Editorial, Business Staffs—16. Advertising Index—191. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $7.50; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1953 by Penton Publishing Co.

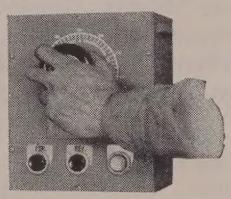
Here's New Data

ON INDUSTRY'S PROVEN WAY TO


INCREASE PRODUCTION and LOWER COSTS
The Most Effective Method
OF POWER TRANSMISSION SERVING INDUSTRY TODAY
RELIANCE

RELIANCE V★S DRIVE®

Contact your nearest Reliance Sales Representative or write us direct for your copy of this new Bulletin D-2311 on Reliance V★S, the all-electric, adjustable-speed drive for A-c. circuits. Describes features and characteristics of V★S Drives from 3/4 to 300 horsepower, shows many typical V★S applications.



Reliance V★S Drive features convenient-to-operate controls grouped and located where your operator can quickly, easily and safely control all functions of his machine.

Sales Representatives in Principal Cities

RELIANCE
ELECTRIC AND ENGINEERING CO.
1081 Ivanhoe Road • Cleveland 10, Ohio

you don't engage a nurse to remove your appendix...

You demand a doctor who specializes in surgery for that job. Our policy too has always been—A SPECIALIST IN CHARGE OF EVERY JOB. Whether erecting an industrial press or constructing a building . . . in all our services to industry an officer of the company, A SPECIALIST, is on the job. General construction . Building alterations . Demolition . Foundations . Press Erecting . Machinery Moving . Crane and Conveyor Installations . Warehousing . Steel Fabrication . Export Packaging

Complete brochure on request. No obligation, of course

COMMERCIAL CONTRACTING CORPORATION

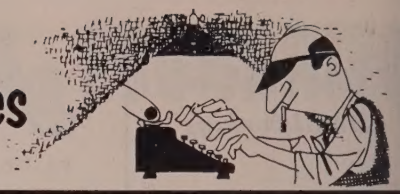
GENERAL CONTRACTORS

12160 CLOVERDALE

DETROIT 4, MICHIGAN

TExas 4-7400

behind the scenes



Meet Bob Huber . . .

Become Machine Tool Editor and See the United States . . . That's the way the little placard sitting on Bob Huber's desk reads, and with good reason.

Here is one of the four travelingest editors on STEEL's very traveled staff, running up something like 30,000 miles in the course of a normal year of story chasing. Imagine spending approximately 600 hours . . . the equivalent of 15 work weeks . . . in catch-as-catch-can slumber on a rolling rattler. Bob does it and likes it.

Machine tools, machine tool accessories and cutting oils and lubricants are Huber's specialties and he is exceptionally well equipped to handle these subjects authoritatively. He is a graduate of Dennison University with a degree in physics. Also holds the distinction of having studied at more universities than any other member of the STEEL editorial staff. Cornell, Harvard and Baldwin-Wallace are the other schools which he has attended for special study.

Bob's practical machine tool experience was received at Warner and Swasey in Cleveland where, among other work, he specialized in original research on cutting oils and lubricants. A compulsion to write caused him to leave a promising career at W & S in favor of his present assignment with STEEL.

Bob's got an unusual hobby. He's a ukulele-fancier. Loves to play them almost as much as he likes to shop for them. Currently he and Art Zimmerman, STEEL assistant editor, are giving the Ohio Bell Telephone Company a bad time with their ukulele antics. They dial each other and play new uke arrangements over the telephone. Bet you'd love to share a party line with these boys!

Huber has two other extra curricular accomplishments which make him the envy of most of his associates. He's got a terrific short iron and putting game that keeps his golf scores in the low and middle 80's . . . in fact, in a purely unofficial listing, Bob ranks second only to the old pro Walt Campbell on the expertness of his game. And, from what the boys in the card room tell me, Huber is second to none at the bridge table. He and his wife Ginger are so expert, in fact, that their usual evening of bridge is limited to less than three kicks under the table. These kids have found Utopia!

Stainless Guide Ready May 18

After a full year of digging, organizing, checking and rechecking, Vance Bell, assistant managing editor, tells us that STEEL's *Guide for Stainless Steel Buyers* is ready to be put into print. Look for it as a special supplement in the May 18 issue.

Here are some especially good reasons why you should be keeping an eye peeled for this valuable reference book: First, it's never been done before. There just isn't any buyers' guide like it anywhere. Second, the aim of the book is to show sizes of selected finished forms of stainless steel produced by mills in the United States. It does so by listing more than 27,000 different entries, each showing a size of product produced at a specific mill.

Stainless Steel products covered in the guide are: Sheets, plates, strip, hot-rolled bars, cold-finished bars, bar-size shapes, tubing and wire.

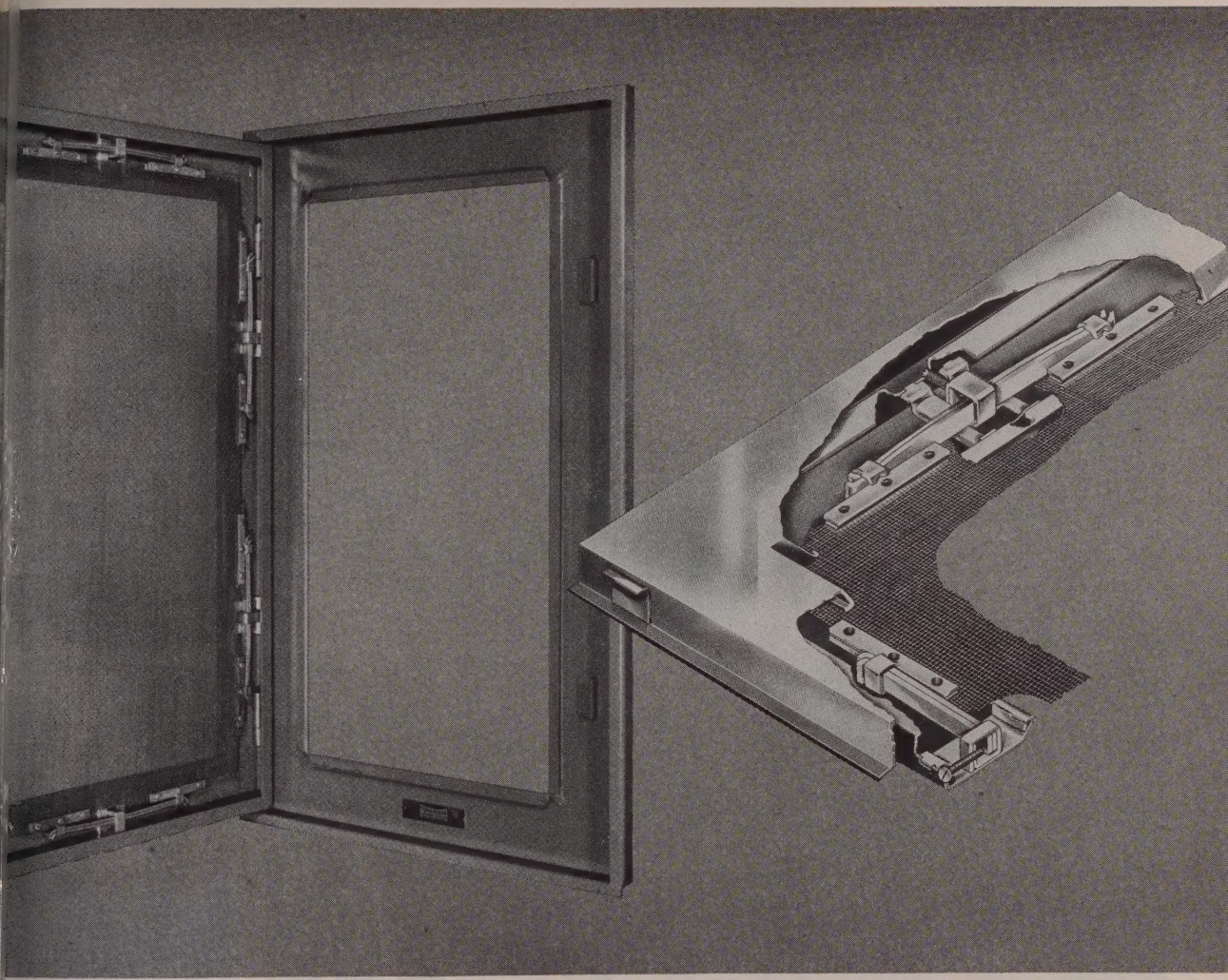
Fifty-one producers of finished stainless steel are listed. Also, each of the eight general classes of products is broken down into groups. For example, sheets are broken down into the following classifications: No. 1 finish in coils; No. 1 finish in cut lengths; No. 2D finish in coils; No. 2D finish in cut lengths; No. 2B finish in coils; No. 2B finish in cut lengths; and No. 4 finish in cut lengths. Under each of these sections is shown the AISI stainless type numbers of stainless, then the thickness of the sheets by gages, the maximum width or range of width, the city where the product is produced and the name and address of the producer.

Our collective hats are off to Vance Bell for the tremendous job he has done.

Shirley

(Metalworking Outlook—Page 39)

SHARON STEEL



Here's Window Construction that's Different

ndows are primarily built to di- t everything but the sun, air and w. There are concerns, however, o build windows primarily to hibit escape. They are detention ndows, and find their market in s and prison hospitals. They re- re special construction to give m the strength to resist the at- ks of both men and weather, d a special design that discour- es tampering.

ecial hard, rust-resistant steels, such as Sharon Galvanite*, are used in the frames. Tough stainless steel screening is firmly gripped by strong spring steel fingers. Here Sharon high carbon spring steels are used to accomplish that never-tiring hold that eliminates the possibility of screen removal. Moldings and exterior trim, subject to the ravages of weather, utilize the best weather-beater of them all—Sharon Stainless Steel.

If you're making windows, or any product that requires quality steels or if your needs are for standard hot or cold rolled steels, and you want the finest, specify SHARON all the way.

* T.M.

SHARONSTEEL

DISTRICT SALES OFFICES

Chicago	Cincinnati
Cleveland	Dayton
Detroit	Indianapolis
Milwaukee	New York
Philadelphia	Rochester
Los Angeles	San Francisco
Montreal, Que.	Toronto, Ont.

SHARON STEEL CORPORATION *Sharon, Pennsylvania*

For information on Titanium contact Mallory-Sharon Titanium Corp., Niles, Ohio

We specialize in solving problems of MOTION

top 10 SOURCES for Mechanical Springs

Contact any Division for Action

WALLACE BARNES COMPANY BRISTOL, CONNECTICUT	**THE WILLIAM D. GIBSON COMPANY** 1800 CLYBOURN AVE. CHICAGO 14.	**RAYMOND Manufacturing COMPANY** CORRY, PENNSYLVANIA	**BARNES-GIBSON-RAYMOND** 40300 PLYMOUTH RD. PLYMOUTH, MICH.	**B-G-R COOK PLANT** ANN ARBOR MICHIGAN
F. N. MANROSS AND SONS CO. BRISTOL CONNECTICUT	**OHIO DIVISION** 1712 EAST FIRST ST. DAYTON, OHIO	**DUNBAR BROTHERS COMPANY** BRISTOL, CONN.	**MILWAUKEE DIVISION** 341 E. ERIE ST. MILWAUKEE, WIS.	**SEABOARD Coil Spring Div.** 435 E. WASHINGTON BLVD. LOS ANGELES 15.

IN CANADA - The WALLACE BARNES CO., Ltd., Hamilton, Ontario

DIVISIONS OF ASSOCIATED SPRING CORPORATION

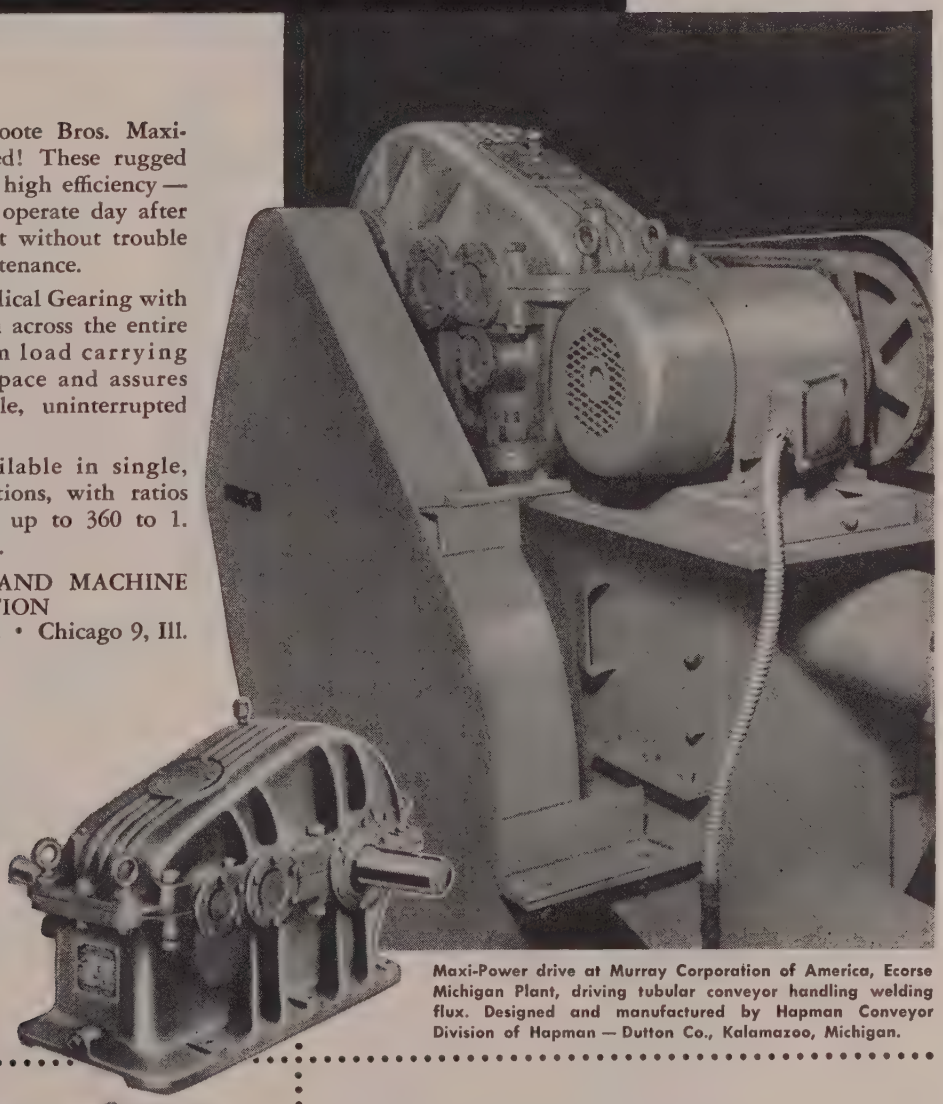
low cost heavy duty service with Foote Bros. MAXI-POWER

Costs go down when Foote Bros. Maxi-Power drives are installed! These rugged helical gear drives assure high efficiency — low maintenance costs — operate day after day, year in and year out without trouble and with minimum maintenance.

Precision-Generated Helical Gearing with uniform load distribution across the entire face permits maximum load carrying capacity in minimum space and assures the maximum in reliable, uninterrupted performance.

These drives are available in single, double and triple reductions, with ratios ranging from 2.08 to 1, up to 360 to 1. Capacities up to 1550 h.p.

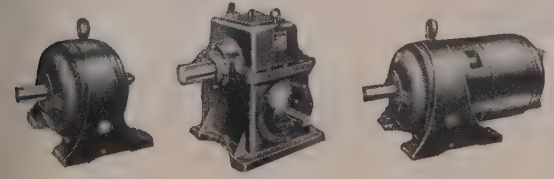
FOOTE BROS. GEAR AND MACHINE CORPORATION
4545 South Western Blvd. • Chicago 9, Ill.



Maxi-Power drive at Murray Corporation of America, Ecorse Michigan Plant, driving tubular conveyor handling welding flux. Designed and manufactured by Hapman Conveyor Division of Hapman — Dutton Co., Kalamazoo, Michigan.

FOOTE BROS.

Better Power Transmission Through Better Gears



Foote Bros. Gear and Machine Corporation
Dept. X, 4545 S. Western Blvd., Chicago 9, Ill.

Please send Bulletin MPB containing full information on Maxi-Power Drives.

Name.....

Company.....

Position.....

Address.....

City.....*State*.....

...VISUAL PROOF of GRAIN FLOW EXCELLENCE

The above macrograph offers visual proof of the uniform grain flow characteristics in a recessed-head screw made from Keystone "Special Processed" Cold Heading Wire. The continuous, strength-giving flow lines indicate efficient cold heading which results in longer die life, increased production and a better finished product.

The following analysis of "special processed" wire is recommended for difficult cold heading.

C1006–C1012 for Clutch Heads
C1006–C1022 for Phillips Heads
C1108–C1109 for Phillips Head Wood Screws
C1035–C1038 for Heat Treated Screws and Bolts

INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

LETTERS
TO THE EDITORS

Lemons Not To Be Advertised

Regarding your "Mirrors of Motordom" column (Apr. 13, p. 77) which dealt with production line carelessness, it was in Washington, D. C., last year that a local court ruled a dissatisfied car owner could not paint or hang lemons on his car to advertise his gripes. Several years ago, a Hartsdale, N. Y., man hung his car, for several weeks, with lemons. I don't know how that owner's gripe was settled.

John H. Caldwell
Sales Management
New York

Search for Booming Plants

We're looking for a list of the ordnance plants, that is, the shell loading and the powder storage operations, throughout the U. S. These installations have been a good market for our Kathabar air conditioning equipment. Have you any idea where we could obtain such a list?

R. C. Wayne
Surface Combustion Corp.
Toledo, O.

• *Local ordnance people say this information is "classified" and, perhaps, impossible to obtain. They suggest you write to the Commanding Officer, Ammunition Center, Joliet, Ill. You might also write the Ordnance Bureau of the U. S. Army, Washington.—ED.*

Now Is Still the Time

Your editorial "Now Is the Time" (Jan. 5, p. 111) is so well phrased and the case for management so ably stated that I would appreciate it very much if you could send me 25 additional copies for distribution among our directors and members of management.

A. J. John
Kearney & Trecker Corp.
Milwaukee

. . . we found "Now Is the Time" stimulating and are passing it on to members of our organization.

H. E. Hubbard
purchasing agent
Consolidated Machine Tool Corp.
Rochester, N. Y.

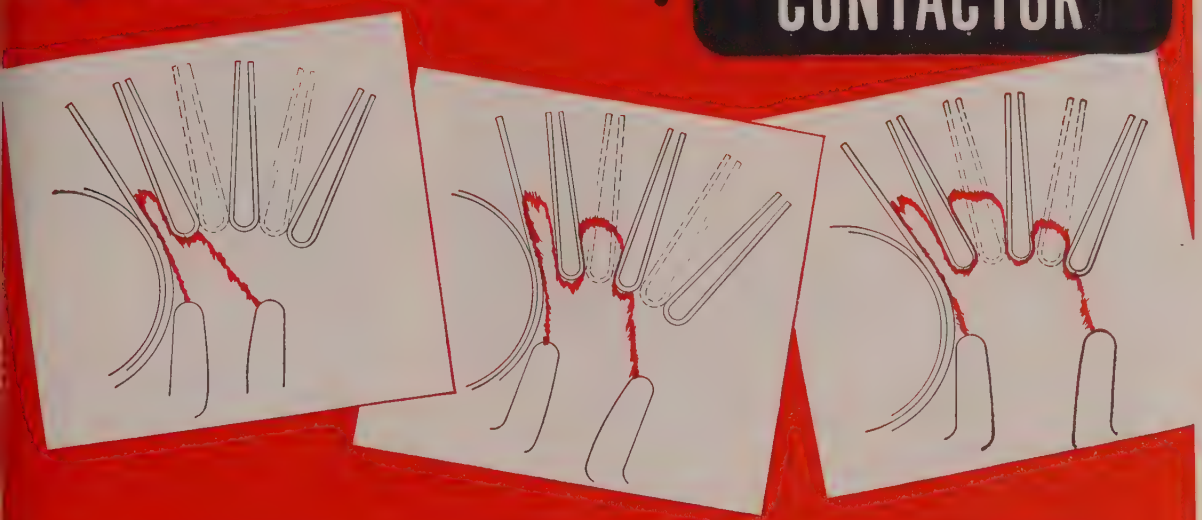
Hours Seem Like Minutes

We noted in the story on "Dual Frequency Heating: Lower Costs Open New Fields" (Apr. 13, p. 140) that the hardening and drawing rate was reported as "60 per minute" which sent us scurrying to our original manuscript of the story to see who was in error. The typographical error was ours. It should be "60 per hour" and, before we are swamped with orders for this amazing

please turn to page 12

trace the arc ...

ALLIS-CHALMERS Mill Type 260 DC CONTACTOR



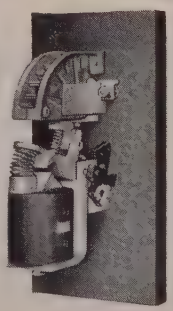
Arc is forced upward along arc runner by magnetic field of blowout coil and impinges upon metal segment of arc chute.

As contacts separate, arc is stretched across an increased number of segments. Arc rises quickly due to thermal convection and magnetic action.

Resistance in arc path increases as number of gaps increase. Metal elements help cool arc path while arc races to extinction.

QUICK QUENCHING CUTS CONTACT BURNING

Normally open



Normally closed

IN THE TYPE 260 heavy duty mill contactor, destructive burning and pitting of contacts is minimized by a new quick-quenching arc centering blowout. U-shaped metal segments mounted alternately in the arc chute act as individual blowout coils. As the arc strikes the loop of each segment, a magnetic field is established which forces the arc upward and toward the center of the chute.

Both thermal convection and magnetic action stretch, cut and cool the arc. Because the arc is extinguished in a cycle or less (on a 60-cycle basis) and is centered in the chute, contact life is greatly extended. Call your nearby Allis-Chalmers District Office or write Allis-Chalmers, Milwaukee 1, Wis. Ask for Bulletin 14B6505A.

A-4017

THREE RATINGS IN BOTH TYPES

Type 260 dc contactors cover virtually every steel mill auxiliary need. Both normally open and normally closed types are rated 150, 300 and 600 amp at 600 volts maximum.

ALLIS-CHALMERS

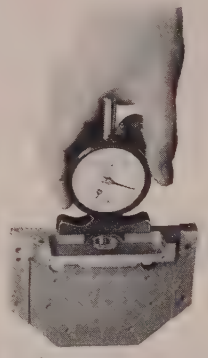
A-C ALLIS-CHALMERS

Why Fiddle Around with OLD-FASHIONED Depth Gages?

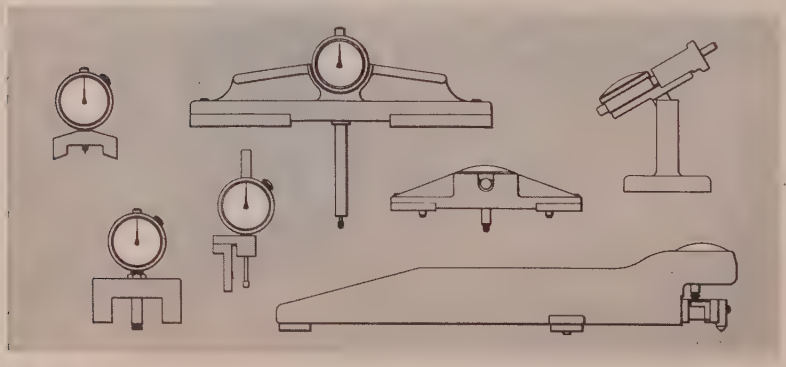
A MAN HAS TO DEVELOP A PRETTY KEEN SENSE OF TOUCH to use a flush pin gage with even reasonable accuracy. And such gages don't show any *trend* when the dimension is getting out-of-control until the operator is producing wrong depths. Micrometer depth gages are slow — they're not as fast, positive or accurate as Dial Indicator Depth Gages.

Federal offers several stock types of Depth Gages and will design and build other types to suit your particular requirements. Tell us what you need and we'll show you something to fit that need. Write, giving us the details. FEDERAL PRODUCTS CORPORATION, 1214 Eddy St., Providence 1, Rhode Island.

A bench type gage having a multitude of applications. Table and Indicator are pitched at a 15° angle for greater visibility. The Dial Indicator can be quickly adjusted vertically to suit depth of workpiece dimension. (Model 75 B-1).



A regular catalog type of portable depth gage which can be had with various lengths of contact points, either radius or pin-pointed, and either self-locating or push-down spindle. (Model 75P).



FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing *all types* of DIMENSIONAL INDICATING GAGES

LETTERS

Concluded from page 10

ly speedy machine, we wish to report this fact to your readers.

M. E. Hackstedde
manager
GECO Inc.
Cleveland

Seekers Steal STEEL

After several weeks of traveling and upon my return, I found two copies of STEEL waiting. However, I had to chase them all over the office to find them. As this subscription is personal and so that I may read without some other earnest seeker purloining my valued copy, please address my copy to me personally.

Further, I trust you have not yet forwarded the Specifications Handbook to me. This choice item will be difficult to pry from the office force. Please forward it to me personally, too.

D. Harold Love
P.O. Box 492
Sault Ste. Marie, Mich.

• *Done.—ED.*

New Alloy Sparks Inquiry

We are interested in the new alloy NA22H mentioned in your article "New Alloy Tough in the Hot Spots" (Nov. 17, 1952, pp. 90-91). We'd appreciate any available data concerning this metal.

R. H. Fishburn
purchasing agent
New Products Corp.
Benton Harbor, Mich.

• *Write to M. N. Ornitz or R. H. English, National Alloy Steel Division, Blaw-Knox Co., Pittsburgh, for further information than is contained in the article.—ED.*

Difficult Standards

I read your editorial of Apr. 6 "Let's Have All the Facts" (p. 55).

Our experience with the Bureau of Standards in Washington in 1940-1941 was very similar to that of the manufacture of an additive for storage batteries which you mention.

In our case we were seeking an approval for a vacuum breaker and despite the fact that our gadget had been tested by the Armour Research Foundation in Chicago under the conditions required by the Bureau of Standards and passed all these requirements; despite the fact that it had been approved by the Bureau of Standards and Appeals of New York City; the Bureau of Standards in Washington would not give us an approval.

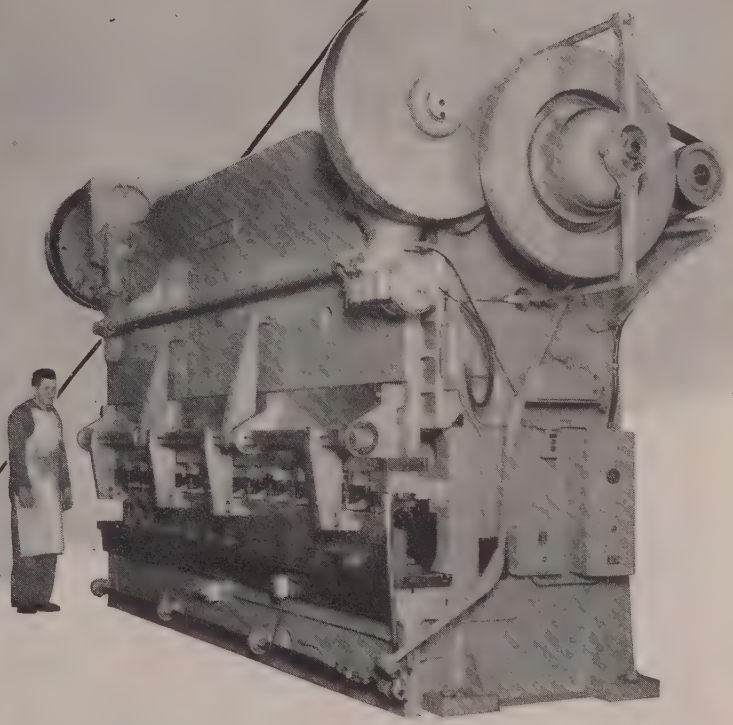
Well, at that time the U. S. was in the middle of World War II. We went to the Army and the Navy, showed them that our gadget could save critical materials and in no time we had our gadget approved.

How naive can you get?

A. B. Delany
Coyne & Delany Co.
Brooklyn, N. Y.

The American Dustube Dust Collector
Photo Courtesy American Wheelabrator and Equipment Corp., Mishawaka, Indiana.

saved 45 minutes every hour!



"American Wheelabrator" says:

Punching Support Angle

OLD METHOD:

Layout time—three hours to layout 12 holes in each 50 angles.

Punching time—25 pieces an hour total punching time, 2 hours for the 50 pieces.

Total time—5.0 hrs.

CINCINNATI METHOD:

Layout time—none.

Punching time—1 1-10 hours to punch 50 pieces.

Total time—1.1 hrs.

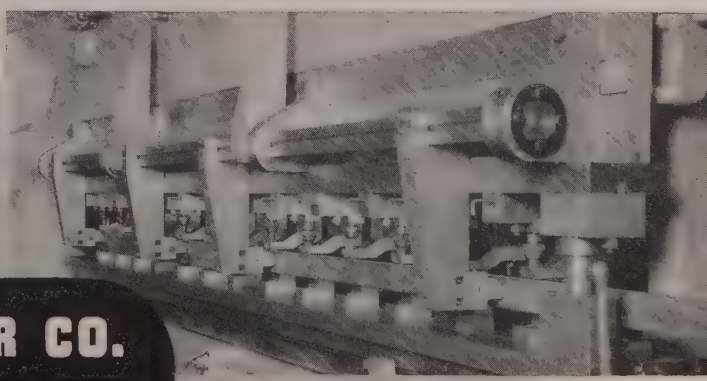
Substantial cost reductions per piece have been effected in the punching of structural channels ranging from 3″ to 8″, and angles up to 5″ x 5″ on this 120 Series 12′ Cincinnati All-Steel Press Brake. This entire range of work is handled with two sets of quickly interchangeable punching blocks.

Location and spacing of holes are maintained accurately throughout all operations with substantial reduction in subsequent assembly costs.

If you punch, form or bend, write our Engineering Department. They will gladly cooperate in lowering the cost per piece in your shop.

CINCINNATI

Write for Press Brake Catalog B2A



Pneumatic clamps automatically hold the work accurately in position. The adjustable center punching blocks give many combinations of spacing and number of holes.

THE CINCINNATI SHAPER CO.

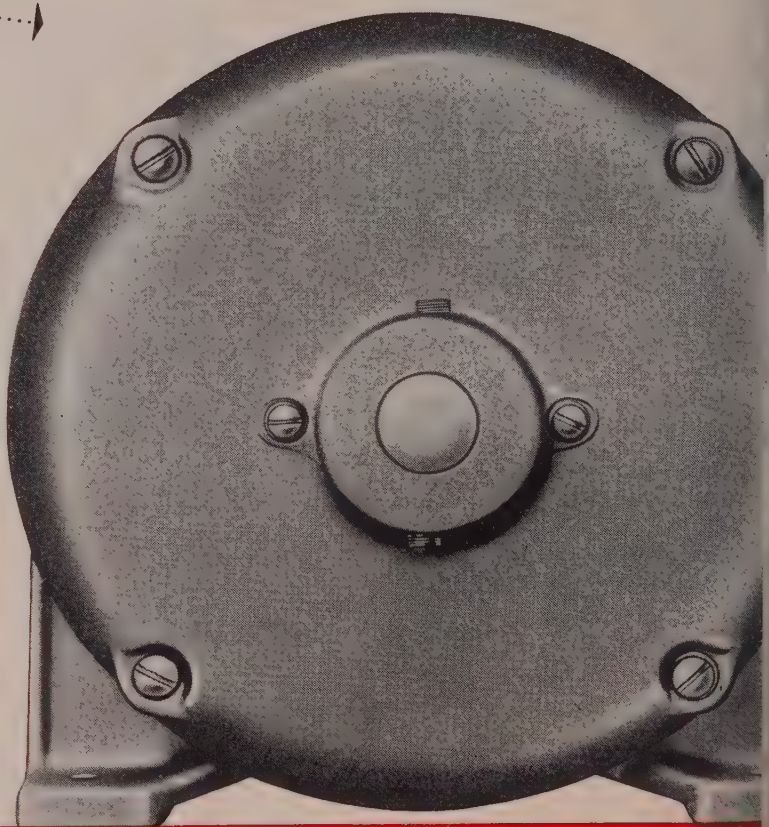
CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

DEPENDABILITY...
that builds dividends
Delco Motors

Delco integral motors are one item of manufacturing cost that does not come under the head of "variable." They are so consistently dependable in operation that they have a stabilizing effect on production costs—and on dividends.

There are Delco motors for most applications—motors that will fit into **your** needs. A sales engineer from any one of the offices listed below will respond to your inquiry.

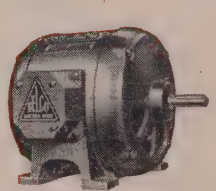


DELCO
DAYTON OHIO

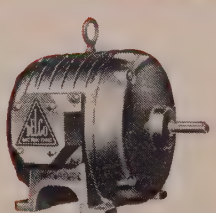
DELCO PRODUCTS

Division of General Motors Corporation
Dayton, Ohio

Explosion-Proof Motor



Open Ball-Bearing Motor



Totally Enclosed Motor

Totally Enclosed Fan-Cooled Motor

SALES OFFICES: Atlanta • Chicago • Cincinnati • Cleveland • Dallas • Detroit • Hartford • Philadelphia • St. Louis • San Francisco

Quantity
PRODUCTION
of
GREY IRON CASTINGS

ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

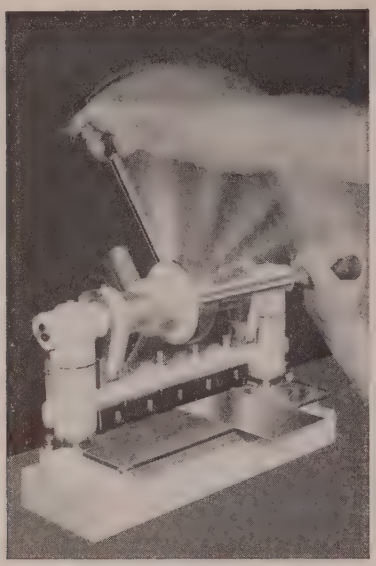
ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

CHATTANOOGA 2, TENNESSEE



Want PRECISION SHEARING at HIGH SPEED?

Check these features and you'll want a Di-ACRO* SHEAR

- **PRECISION** — strips less than .025″ wide accurately sheared. Thousands of parts exactly duplicated.
- **CUTTING SPEED**—rivals that of power machines.
- **RATED CAPACITY**—16 gauge.
- **EASY TO OPERATE**—a woman can operate it.
- **CHOICE OF MODELS**—available in four sizes. Widths from 6 to 24 inches. Four power models also available.
- **ENGINEERING SERVICE**—always at your disposal.
- **PORTABLE**—readily moved.
- **RUGGEDLY BUILT**—backed by one year warranty.
- **DELIVERY**—immediate on most models.
- **COST**—that's good too.

*pronounced Die-ack-ro

LIKE MORE INFORMATION?

Send for 32-page catalog

Gives full details on both hand and power operated Di-Acro Shears, Benders, Brakes, Notchers, Punch Presses, Rod Parters and Rollers. Mail your request today.

Creators of "DIE-LESS DUPLICATING"

O'NEIL-IRWIN MFG. CO.
304 8th AVE.
LAKE CITY, MINN.

di-acro PRECISION METALWORKING MACHINES

STEEL

The Weekly Magazine of Metalworking

Editor-in-Chief, EARL L. SHANER *Editor*, IRWIN H. SUCH
Managing Editor, WALTER J. CAMPBELL
Assistant Managing Editors, VANCE BELL, JOHN S. MORGAN

News and Markets

WM. M. ROONEY..... *Market Editor*
FRANK R. BRIGGS .....*Associate Editor*
ARTHUR W. ZIMMERMAN..*Assistant Editor*
JOHN KELSEY .....*Assistant Editor*
ROBERT O. JAYNES .....*Assistant Editor*
ROBERT M. LOVE.....*Assistant Editor*
H. VANYORX CALDWELL JR. *Assistant Editor*
DAVID S. PARRETT .....*Assistant Editor*
MARY T. BORGERHOFF.....*Assistant Editor*

Engineering and Production

EDWIN L. KARPICK.....*Engineering Editor*
ALLEN G. GRAY.. .....*Technical Editor*
J. D. KNOX.....*Steel Plant Editor*
ROBERT F. HUBER.....*Machine Tool Editor*
WM. R. WOLFE.....*Assistant Editor*
THOMAS F. HRUBY.....*Assistant Editor*
DOLORES K. MAILLE.....*Assistant Editor*
NANCY SHAFFER.....*Editorial Asst.*
ELIZABETH RIPLEY .....*Editorial Asst.*

Resident Editors

New York 17..... 60 East 42nd St.
B. K. PRICE, L. E. BROWNE
SAMUEL W. BAKER
Murray Hill 2-2581

Chicago 11 .... 520 North Michigan Ave.
E. F. ROSS
Whitehall 4-1234

Pittsburgh 19 ..... 2837 Koppers Bldg.
ROBERT E. HALL
Atlantic 1-3211

Detroit 2..... 6560 Cass Ave.
FLOYD G. LAWRENCE
Trinity 5-3024

Washington 4 . 1123 National Press Bldg.
E. C. KREUTZBERG
Executive 3-6849

London, 2 Caxton St., Westminster S.W. 1
VINCENT DELPORT
European Editor

Editorial Correspondents

Birmingham R. W. KINCEY
Birmingham 3-1121

Buffalo .. L. G. FELDMANN
Cleveland 5353

St. Louis .... MAC L. HUTCHENS
Republic 7752

Youngstown .. .. GEORGE R. REISS
7-1471

Los Angeles .. NORMAN LYNN
Walnut 3040

San Francisco EDWIN HAVERTY
Yukon 6-5151

Seattle .. .. R. C. HILL
Melrose 1895

Dallas ....C. K. CATES
Riverside 4355

Toronto .... F. S. TOBIN
Empire 4-9655

Birmingham, Eng. ..... J. A. HORTON
Paris, France .....LEON JAUDOIN-PROM
Liege, Belgium .....M. JACQUES FOULON
Dusseldorf, Germany...DR. HERBERT GROSS

BUSINESS STAFF

Business Manager .... J. W. ZUBER
Promotion Manager .....S. F. MARINO
Circulation Manager .....G. R. EBERSOLE
Research Manager.....N. R. LADABOUCHE
Market Statistics .....G. J. AUNER

Advertising Manager ... ... C. H. BAILEY
Production Manager .....A. V. ANDERSON
Classified Advertising Mgr...DORIS ROBBINS
Mail & List Service.....AMY LOMBARDO
Reprints .....C. B. NILES

Advertising Representatives

New York 17.. ..... 60 East 42nd St.
E. W. KREUTZBERG, K. A. ZOLLNER
Murray Hill 2-2581

Farmington, Conn. ... 12 Farmstead Lane
CALVIN FISHER, JR.
Farmington 7-1756

Pittsburgh 19 . 2837 Koppers Bldg.
S. H. JASPER, J. C. SULLIVAN
Atlantic 1-3211

Cleveland 13 . . . . ..Penton Building
D. C. KIEFER, H. G. ROWLAND
Main 1-8260

Cincinnati 30 .....5568 Beechmont Ave.
E. L. FRANKE—Parkway 3640

Detroit 27 .....14583 Longacre Rd.
C. A. TALLINGER JR.—Vermont 8-7207

Chicago 11 520 North Michigan Ave.
L. C. PELOTT, W. L. POLAND
JOHN W. VAUGHAN
Whitehall 4-1234

Los Angeles 48 6262 Commodore Sloat Dr.
F. J. FULLER—Webster 1-6865

Griffin, Georgia ... ... 331 South 12th St.
FRED J. ALLEN—Griffin 7854

Circulation Representatives

H. R. DUNNE, C. A. PRICE

Published Every Monday by

THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio

President and Treasurer..... G. O. HAYS
Chairman .. ..E. L. SHANER
Vice Pres., Director of Advertising R. C. JAENKE
Vice Pres. and Secretary .....F. G. STEINEBACH
Asst. Secy. and Asst. Treas. .....J. P. LIPKA

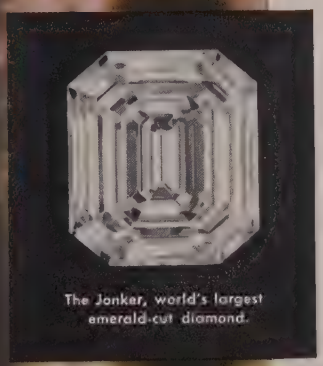
Also Publisher of FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST

Member of Controlled Circulation Audit, Inc., Magazine Publishers Association Inc., Society of Business Magazine Editors, and National Business Publications, Inc.

Here is perfection!

ROEBLING makes the finest high carbon wire available to industry today. Roebling wire is absolutely true to specifications... absolutely uniform in gauge and finish. Manufacturers who try Roebling wire once, become Roebling customers from then on.

You *pay* for the best when you buy high carbon wire. Make sure that you *get* it! Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.



The Jonker, world's largest emerald-cut diamond.

ROEBLING [Fe]

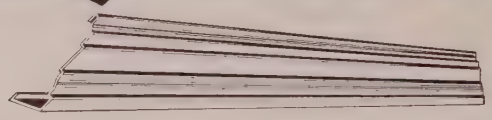
A subsidiary of The Colorado Fuel and Iron Corporation

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

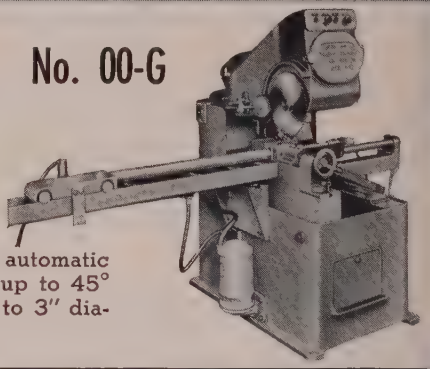
. . . IT'S THE Cost per Cut THAT Counts

Study these high production, low cost figures on three Motch & Merryweather Circular Sawing Machines

Make your own study of the cost per cut in your metal-sawing department. Then find out from Motch & Merryweather how much production at lower cost you can get on M. & M. Circular Sawing Machines, using our Triple-Chip blades.



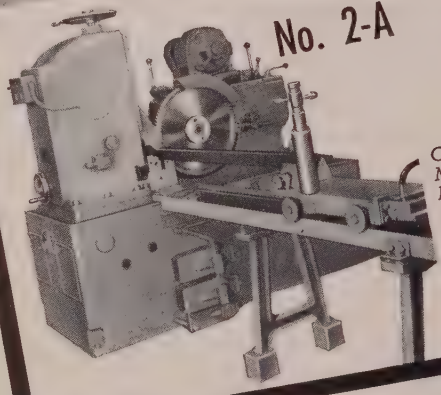
No. 00-G



Operation: Steel door frames (mitre cut).
Material: Rolled steel shapes 6" wide x 1/16" thick.
Production: 200 pieces per hour.
Tool cost per piece: $.0002.

M. & M. No. 00-G Circular Sawing Machine. Manual or automatic stock feed. Readily adaptable to making cuts at angles up to 45° as well as high production square cut-off. Capacity: up to 3" diameter round; shapes—up to 3-3/8" x 6".

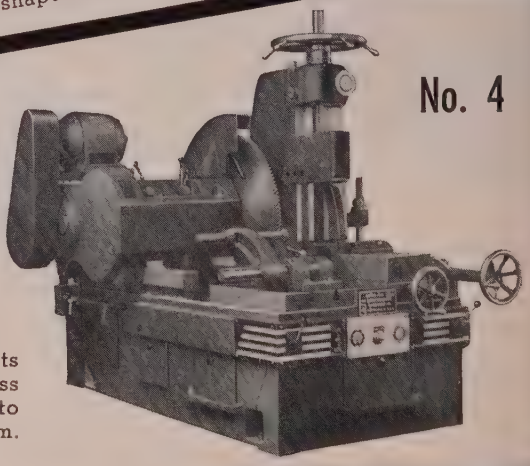
No. 2-A

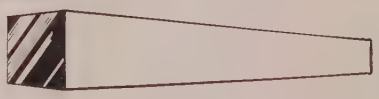


Operation: Rocket nozzle stock cut to length.
Material: S. A. E. 1020, 5" diameter.
Production: 60 pieces per hour.
Tool cost per piece: $.001.

The No. 2-A machine pictured at the left has automatic stock feed up to 72" cut-off lengths. It is offered also with manual stock feed. Capacity: up to 6-1/2" diameter round; structural shapes—up to 5" x 12".

No. 4





Operation: Forging billets cut to length.
Material: S. A. E. 1045, 14" square.
Production: 6 pieces per hour.
Tool cost per piece: $.12.

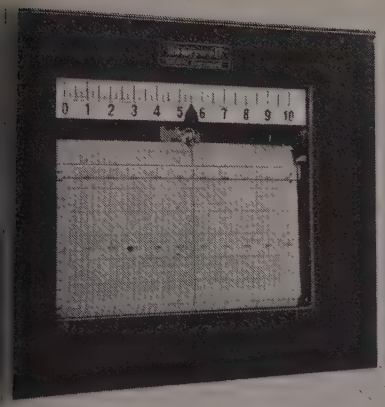
No. 4. Widely used in steel and structural steel plants and forge plants sawing all types of forging, stainless and titanium alloys, die block steel, etc. Capacity: to 17" dia. round; structural shapes up to 24" I-beam.

Complete size range, ferrous or non-ferrous, up to 43" diameter.

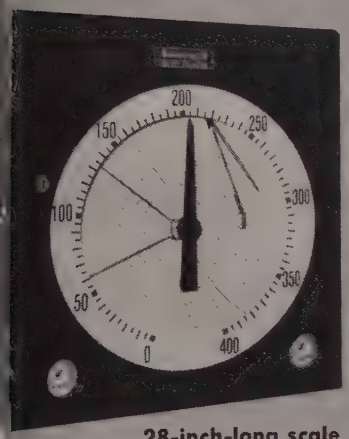
Manufactured by —THE MOTCH & MERRYWEATHER MACHINERY CO.—
CLEVELAND 13, OHIO
Builders Also of Production Milling, Vertical Turning, Automatic and Special Machines

Only M. & M. builds ALL 3s CIRCULAR SAW SAW BLADE BLADE GRINDER

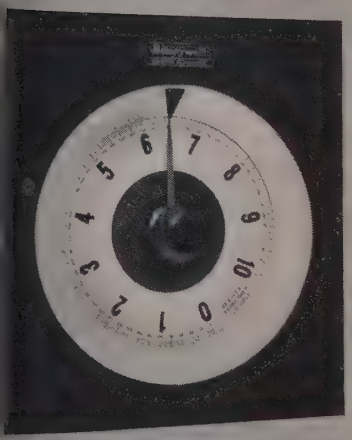
PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT



11-inch-wide strip chart



28-inch-long scale



"12 o'clock" control check

Since 1940 —

Laboratory accuracy for *production control...* with *ElectroniK* instruments

For the last fourteen years *ElectroniK* instruments have been an important part of the industrial scene . . . for they were the first to bring high-speed, continuous measurement and control into practical reality in industry.

They made news then, by placing laboratory accuracy in the hands of production men . . . permitting them to achieve improvements in quality and efficiency that can be obtained only through more exact process control. And they're still making news today . . . helping to guide complex, precise, process operations.

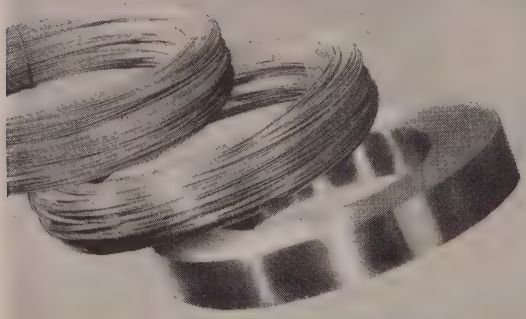
These versatile instruments can measure, and often control, practically any process variable . . . temperature, flow, pH, conductivity, humidity, weight and dozens of others. They are available as indicators, recorders, and electric or pneumatic controllers . . . in many control variations, capable of handling the toughest assignments.

An outstanding record of dependability, accuracy and ease of maintenance has earned *ElectroniK* instruments an enviable reputation of accomplishment throughout industry. This stems from rugged, service-tested design of every component . . . design that assures uninterrupted service, optimum operation.

Your local Honeywell engineering representative will be glad to discuss how *ElectroniK* instruments can help in your lab or plant. Call him today . . . he is as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4462 Wayne Ave., Philadelphia 44, Pa.

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls



Follow Through IS IMPORTANT

From the time master craftsmen make the basic raw materi in our own Steel Mill until Washburn Wire and Strip is read for shipment to our customers, specifications for uniformit in all respects are rigidly followed . . . at various stages percentage of each operation is examined microscopically

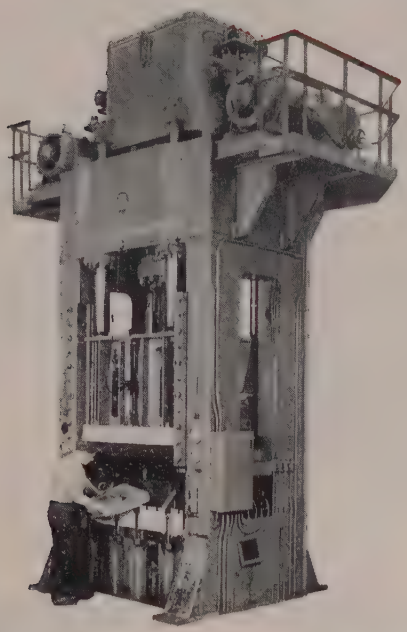
It's this STRICT FOLLOW THROUGH that produc WASHBURN Steel . . . Top Quality Steel that gives yo products the advantage of today's advancing standards. Strip, rectangular, round and flat rods, tempered and untem pered flat and round high carbon wires fit into your pictur write for information on any application you have in mind.

WASHBURN WIRE COMPANY, NEW YORK CIT

WASHBURN

CLEAN, UNIFORM BILLETS STRIP RECTANGULAR, ROUND, FLAT ROD TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRE

The trend is to more stampings WITH BLISS PRESSES...



1200 14-gauge drip pans are drawn and formed daily in this Bliss press which has a 400-ton blankholder pressure and 200-ton plunger capacity.

Hard-to-make contours in this center-section stamping for a Weathermaker are drawn from 20-gauge steel at the rate of 1800 daily.

Versatile Bliss Hydro-Dynamic Allows Unusual Metal Design

A new 600-ton Bliss double-action Hydro-Dynamic press helps Carrier Corporation produce nice-to-look-at but tough-to-make contours for its line of air conditioners.

Carrier's Vice President of Manufacturing reported that, "By varying ram, blankholder and cushion pressures and the draw cycle, we have been able to complete difficult drawing operations with sharp corners and small radii at the bottom... Actually, the press has exceeded our expectations."

Top performance? Of course—but it's all a matter of picking the proper press. It's what Bliss engineers mean by "the *right* press for the job."

Top panel for window-model Room Air Conditioner has intricate contours, sharp corners and bottom radii. Yet Carrier was able to produce them at the rate of 1200 per eight-hour shift.

E. W. BLISS COMPANY, CANTON, OHIO

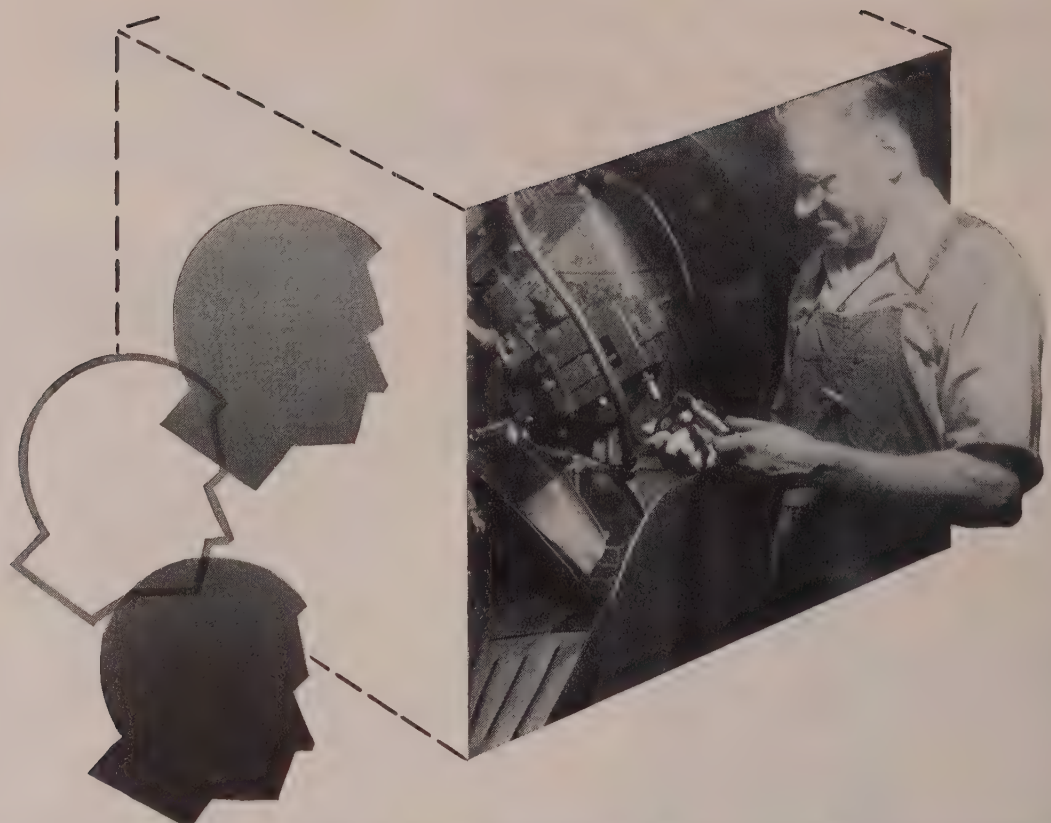
E. W. Bliss (England) Ltd., Derby, England

E. W. Bliss Company (Paris), St. Ouen sur Seine, France

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Branch offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo; and Toronto, Canada. **West Coast Representatives:** Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Co., Seattle. **Other dealers** in United States cities and throughout the world.

BLISS ON YOUR PRESS IS MORE THAN A NAME ...IT'S A GUARANTEE!



3-Dimension Metallurgical Service PLUS Pre-tested Machinability...

MAKE LIFE EASIER *for* AUTOMATICS OPERATORS

...who use Republic Union Cold Drawn Steels

Making sure that each lot of Union Cold Drawn Steel is right *before* it is shipped is only half of our responsibility...*after* you have received it, the Republic Field Metallurgist wants to make sure that the steel is running right, processing right. He can help you with tooling suggestions and surface-treatment recommendations.

He is one member of the Republic 3-Dimension Metallurgical Team...backed-up at home by a Republic Mill Metallurgist and a Republic Laboratory Metallurgist.

That's why you can always be sure that on your job Republic Union Cold Drawn Steels will give you *top machinability* . . . long tool life, high production rates at low per-cent cost, and uniform results.

Find out more about Union Drawn *pre-tested machinability* . . . use Republic 3-Dimension Metallurgical Service . . . a call to your Republic Sales Office will start things. Or write to:

REPUBLIC STEEL CORPORATION
Union Drawn Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

LAB
FIELD MILL
3-DIMENSION Metallurgical Service

...combines the extensive experience and co-ordinated abilities of Republic's *Field, Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide manufacturers in countless industries to the correct steel and its most efficient usage, IT CAN DO THE SAME FOR YOU.

Republic UNION® COLD DRAWN STEELS

REPUBLIC STEEL

Free-Machining Bessemer, Alloy and Enduro Stainless Steels • • Union Cold Drawn Special Sections
Union Cold Drawn and Ground Rounds; Turned and Polished Rounds; and Turned, Ground and Polished Rounds (Union Precision Shafting)

Your "Hole" Future

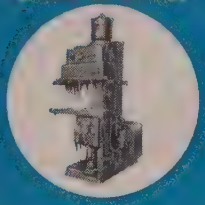
IS ASSURED WITH NATCO EQUIPMENT

ENGINEERED FOR QUALITY AND QUANTITY PRODUCTION

ADJUSTABLE SPINDLE MULTI-DRILLER AND TAPPER

MEDIUM SIZED VERTICAL DRILLER AND TAPPER

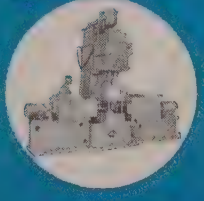
HIGH-SPEED MULTI-DRILLER OR TAPPERS



A-33 LIGHT SENSITIVE MULTI-DRILLER OR TAPPERS

3-WAY BORFACE FOR BORING, TURNING AND FACING

3-WAY HOLETAPPER WITH INDIVIDUAL LEAD SCREWS



HOLESTEEL 2-WAY FLOOR TYPE FOR DRILLING AND TAPPING

HOLEWAY AUTOMATIC PROCESSING MACHINES

2-WAY HOLEUNIT FOR DRILLING, BORING, REAMING AND TAPPING

STATION TYPE MACHINES

Here are a few representative machines from the complete NATCO line . . . including a wide range from small, fast, light sensitive multi-drillers and tappers to large automatic processing machines . . . from single spindle to an unlimited number of spindles . . . from 1/16 inch drill to 14 inch or larger bore. Materials worked include iron, steel, bronze, aluminum, plastic and wood. Call a NATCO Field Engineer.

Call a Natco Field Engineer

To help you solve your problems in Drilling, Tapping, Boring & Facing.

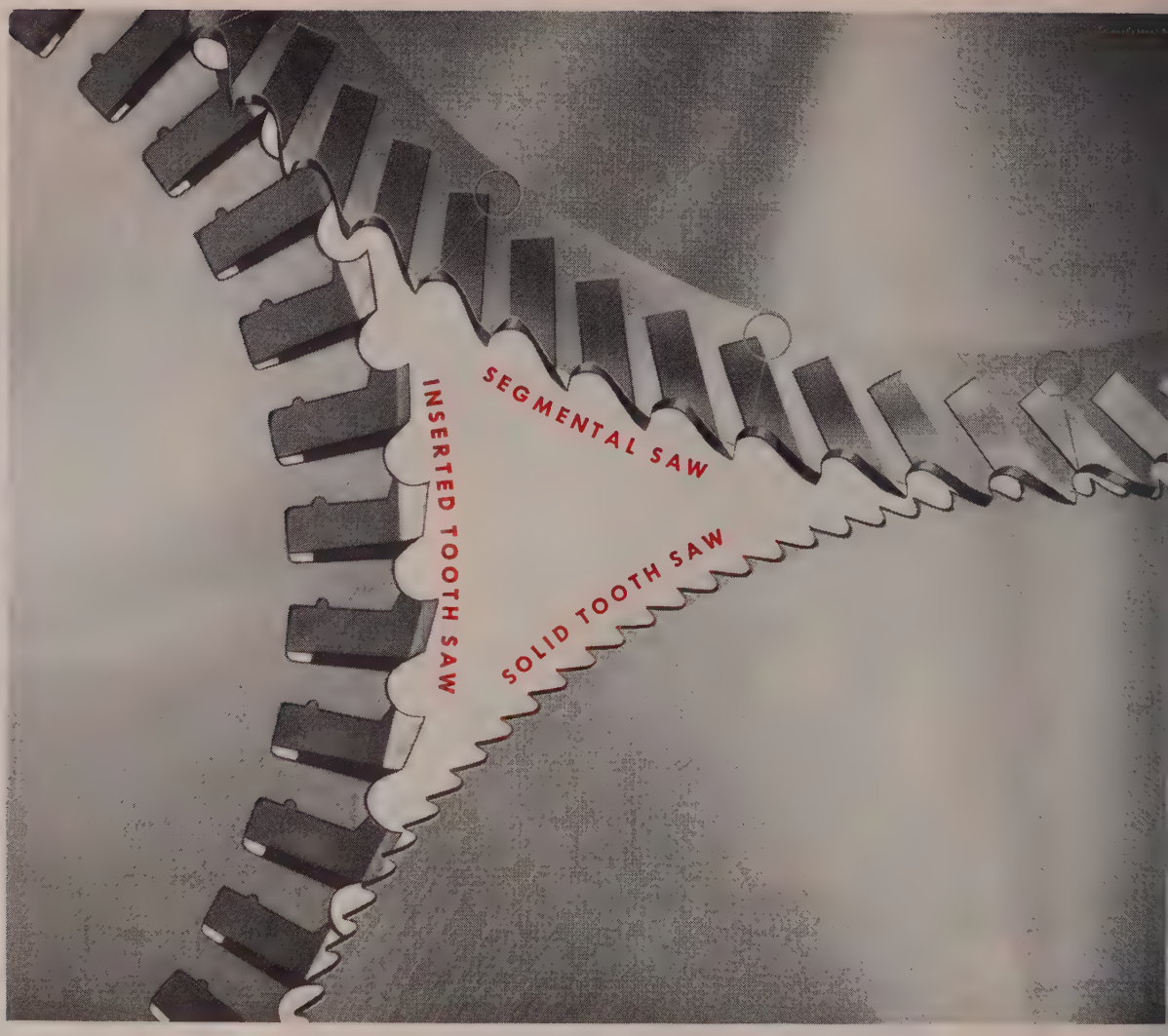
NATCO

NATIONAL AUTOMATIC TOOL COMPANY, INC., Richmond, Indiana

Branch Offices

1809 Engineering Bldg., CHICAGO • 409 New Center Bldg., DETROIT
1807 Elmwood Ave., BUFFALO • 2902 Commerce Bldg., NEW YORK CITY

NATIONAL MACHINE TOOL BUILDERS' ASSN. 1902 1952 50th ANNIVERSARY



"Pick your Teeth!"

For the best saw-performance on your job... SIMONDS gives you a choice of *All 3 Types!*

INSERTED TOOTH: For heavy production cutting of all steel, brass, copper, and aluminum. Alternating square and beveled teeth "tri-vide" chips for easy cutting and clearance. Teeth can be easily replaced, singly or in complete sets, in your own plant by any average mechanic.

SOLID TOOTH: For general shop cut-off jobs . . . for use on smaller automatic cut-off machines and for cutting jobs where narrow kerf is important.

SEGMENTAL: For especially smooth cuts on production work. High Speed steel toothed segments are securely held in a tough alloy plate by a special tongue and groove design, have quick clearance for faster, freer cutting.

SIMONDS MAKES ALL THREE TYPES OF CIRCULAR METAL-CUTTING SAWS. So you can be sure that SIMONDS will give you *the right saw for your job* . . . for any type of machine. See your Simonds Distributor today, or write the nearest Simonds Office.

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.

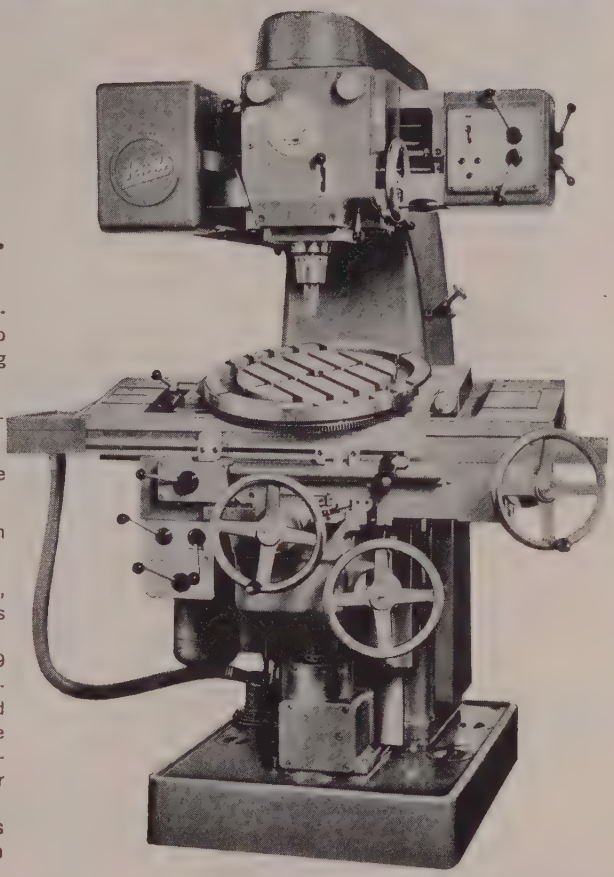
Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon. Canadian Factory in Montreal, Que. Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Simonds Abrasive Co., Phila., Pa. and Arvida, Que., Canada

3 in 1 machine tool

ombines vertical milling, ownfeed milling and jig boring

now available

for prompt delivery...



n one set-up of the work, the HURTH Precision Boring and Mill- g Machine performs three different machining operations to ose tolerances—you merely change table settings and cutting ols for—

ERTICAL MILLING —using the longitudinal traverse of the work- able, which can be tilted 15° to front or rear.

OWNFEED MILLING —using the longitudinal traverse of the orktable and graduated downfeed of the cutting spindle.

IG BORING —using the continuous spindle downfeed, which can e varied in extremely small steps.

pecifically designed for precision machining of jigs, fixtures, nolds, dies, gages and similar close-limit tooling, the HURTH is qually adaptable for small-lot and long-run production work.

13 spindle speeds cover the range from 45 to 2,800 rpm. 9 oring speeds are available for each of the spindle speeds. Pre- ision cutting is assured by the extremely long spindle quill guided n a precision-bored hole, with a double-row roller bearing in the pindle head maintaining a true running spindle. The rugged con- truction of the machine virtually eliminates distortion under oad.

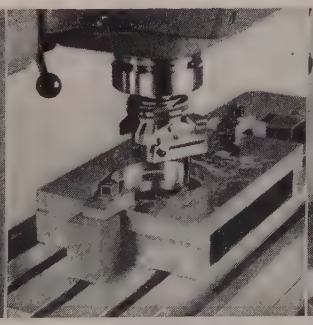
Gage block measuring equipment on the worktable enables perator to accurately check the work while it remains in position n the machine.

The HURTH 3-in-1 machine will cut costs as fast as it cuts hips... in your toolroom or on your production line. Write for terature and complete specifications.

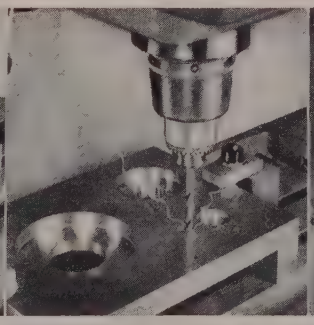
HURTH V 10a—Boring and Milling Machine with 19¾" swivel table in position on worktable. Worktable area is 11¾" x 39¼".

Engineered servicing from Orban Service Centers in Cleveland, Detroit, Newark. Stock parts from Cleveland.

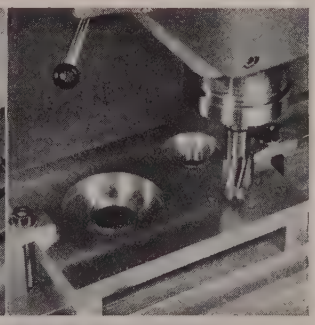
MACHINING A BULKY WORKPIECE *held on the tilting table. Note deep throat of machine.*



BORING AND FACING *operations, using a boring and facing head.*



DRILLING *holes for drill jig bushings.*



JIG BORING *holes, previously drilled in the HURTH machine.*

KURT ORBAN

COMPANY, INC.

INDUSTRIAL IMPORTERS

205 East 42nd St., New York 17 • 4220 Prospect Ave., Cleveland 3 • 19450 James Couzens Highway, Detroit 35
1939 Santa Fe Ave., Los Angeles

Get your copy.

WRITE FOR IT TODAY!

Here's a TOOL STEEL STOCK LIST that's really *Clear, Concise* and *Dependable!*

There's an A-L Tool Steel to do each job *best*

The Allegheny Ludlum Tool Steel family includes 37 principal types, covering the high speed, hot work, shock resisting, cold die, and carbon and low alloy steel fields. Let us help you find the best answer to *any* problem that occurs in your production or use of cutting and forming tools.

ADDRESS DEPT. S-40

This 72-page catalog lists the stocks of A-L High Speed and Tool Steels which are constantly maintained in each of 18 warehouses, located at convenient points from coast to coast. In compact, easy-to-follow style, the book gives a complete stock picture, nationwide, of the 15 most widely used types of these steels—each in a full range of standard shapes and sizes—and also includes data on stocks of drill rod, tool bits and Carmet carbide metal blanks and tools.

It may be that your requirement call for mill shipments. If so, you ca rely on us to schedule material for yo without delay. *But*—if you depen entirely or in part upon ordering Hig Speed and Tool Steels in smaller lo —and want to know where you ca get them *quickly*—you'll find A-L' book of "Warehouse Stocks" might handy to have in your desk. ● Writ for your copy *today! Allegheny Ludlu Steel Corporation, Henry W. Olive Bldg., Pittsburgh 22, Pa.*

For complete **MODERN** Tooling, call

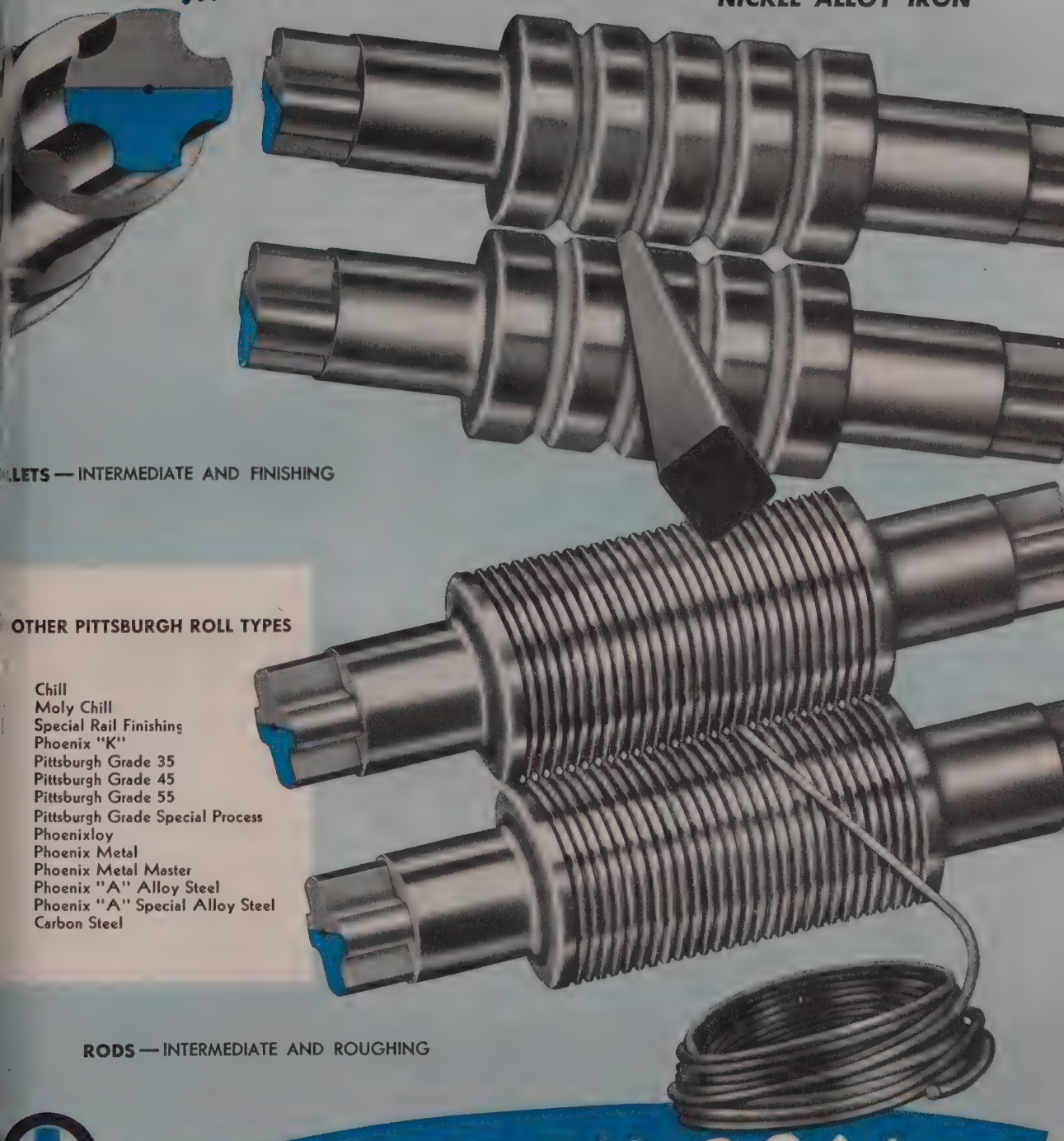
Allegheny Ludlum

W&D 3529

AL FINE TOOL STEELS SINCE 1854

* PITTSBURGH GRADE "25" ROLLS are color marked for specific uses in rolling . . .

*NICKEL ALLOY IRON



LLETS — INTERMEDIATE AND FINISHING

OTHER PITTSBURGH ROLL TYPES

Chill
Moly Chill
Special Rail Finishing
Phoenix "K"
Pittsburgh Grade 35
Pittsburgh Grade 45
Pittsburgh Grade 55
Pittsburgh Grade Special Process
Phoenixloy
Phoenix Metal
Phoenix Metal Master
Phoenix "A" Alloy Steel
Phoenix "A" Special Alloy Steel
Carbon Steel

RODS — INTERMEDIATE AND ROUGHING

P.R.W.

PITTSBURGH ROLLS

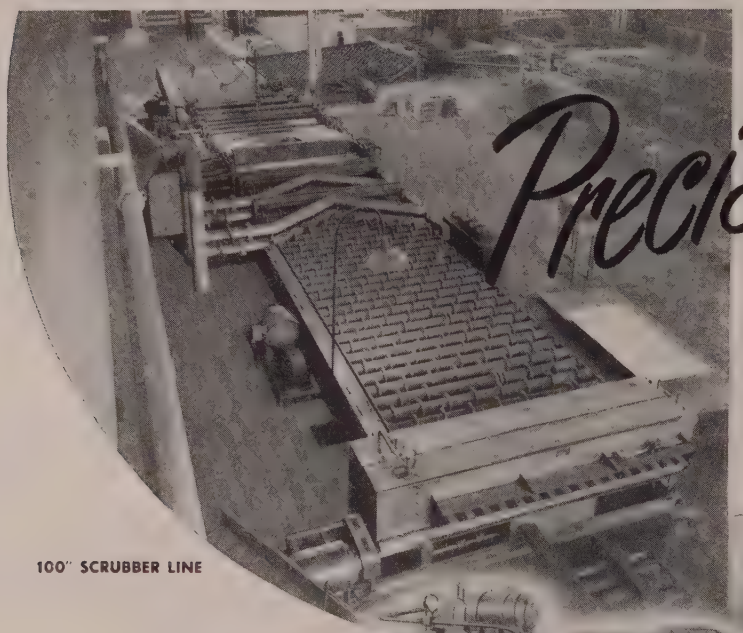
ROLLS DIVISION of BLAW-KNOX COMPANY • PITTSBURGH, PA.

STEEL MILL EQUIPMENT

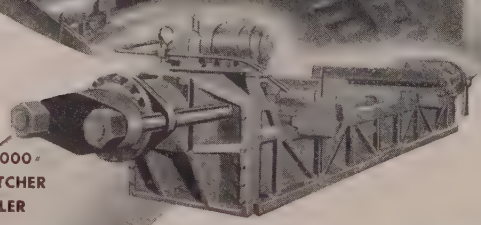
Precision built

BY

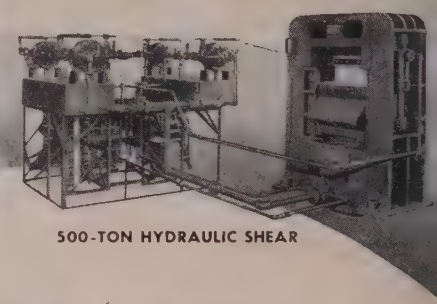
Y&M



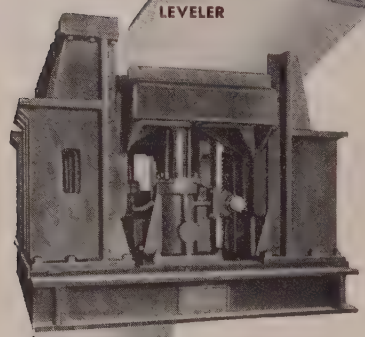
100" SCRUBBER LINE



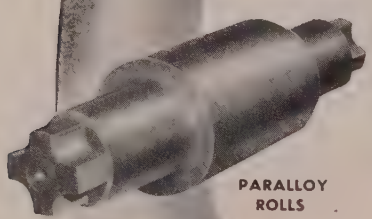
800,000# STRETCHER LEVELER



500-TON HYDRAULIC SHEAR



SLAB PILER



PARALLOY ROLLS

Check this List for the Products You Need

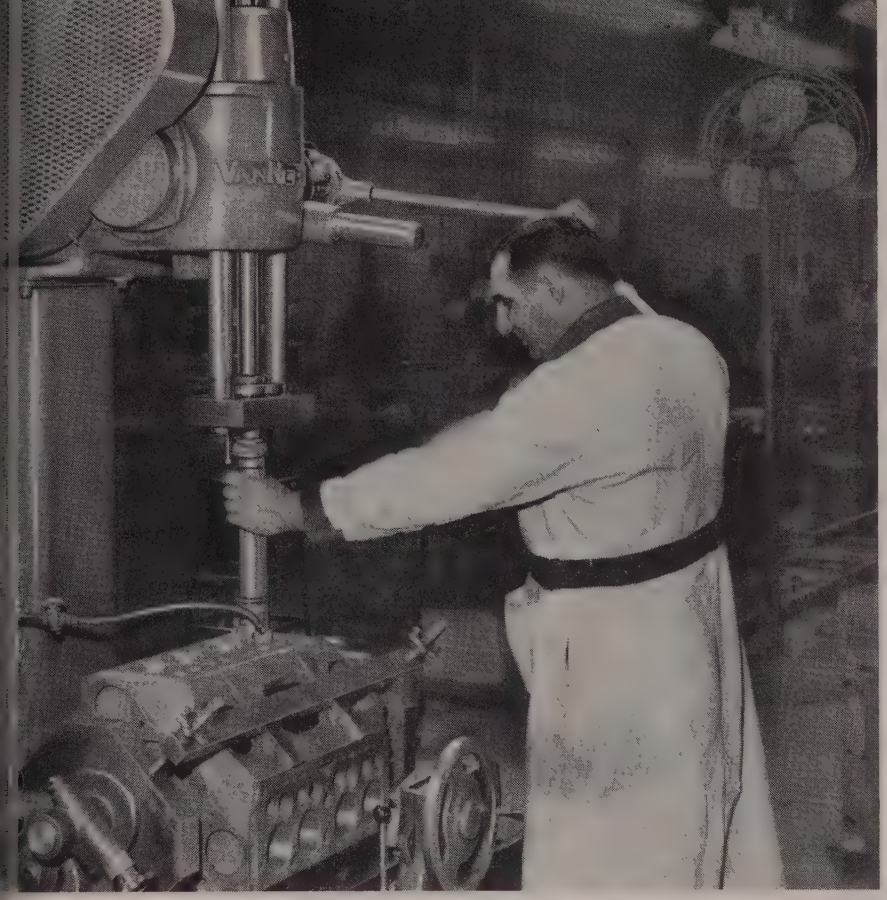
- PARALLOY ROLLS (Pinch, Coiler, Tension, Steel Mill)
- HYDRAULIC SLAB AND BILLET PILERS
- STRIP AND SHEET OILING EQUIPMENT
- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—Traveling and Lifting Tables
- Continuous PICKLING Lines—ROLLER LEVELERS
- FURNACE Charging Equipment—Furnace Pushers
- Strip Steel COILERS and REELS—SCRAP BALLERS
- RAILROAD Spike Forming Machines—ROLL LATHES
- Sheet GALVANIZING Lines—Wire Patenting Frames
- Stretcher Levelers—Angle and Shape Straighteners
- Rolling Mill Tables—Gear and Individual Motor Types
- DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings

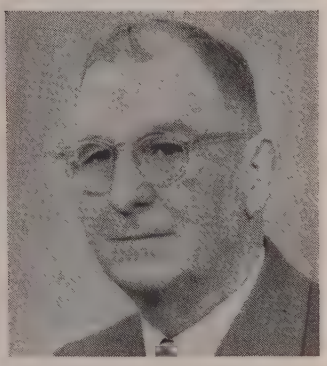
The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio



What's YOUR Problem?



J. E. Weston, of Standard Oil's Kansas City office, is the lubrication specialist who helped this metalworking company solve a "finish" problem on the honing operation described at the left.

Like all of the many Standard lubrication specialists located throughout the Midwest, he has the experience and special training necessary to analyze his customer's needs. Like all of Standard's lubrication specialists, he is close at hand and therefore able to give his customer on-the-spot assistance.

You can reach the lubrication specialist serving your area of the Midwest by phoning your local Standard Oil office. He will be glad to discuss your operations and with no obligation to you. There may be savings for you in the benefits offered by such outstanding cutting oils as:

STANICOOL HD Soluble Oil — Because it contains additional compounding, this heavy-duty soluble oil possesses not only the cooling ability of an emulsion but also the ability to give better tool life and finer finishes than can be obtained with a conventional soluble oil.

STANOSTAMP Compounds — Here are three established products for stamping or heavy drawing operations of either low-carbon or alloy steels. Water can be added to these paste compounds to provide the most economical applications. STANOSTAMPS offer maximum protection for dies and work. These compounds can be removed readily in conventional washing equipment.

Better honing results from start to finish with...

STANICUT
TRADE MARK
Cutting Oil

. midwest metalworking company—ebuilder of a popular automobile engine -had a cutting oil problem. On the hon-ng operation, shown above, the finish btained on engine cylinders did not neasure up to the high quality desired y that firm. Various honing oils were ried without measurable improvements.

The problem was put to a Standard Oil utting oil specialist. He recommended ne use of STANICUT Oil No. 62 FC, a ght-colored, light-bodied cutting oil nat contains the correct proportion of xtreme-pressure and friction-reducing ngredients. From every angle, STANICUT as proved ideal for the job. The desired nish has been obtained on the cylinders. 'ool life has been greatly increased. Oil consumption has been reduced.

Whatever your machining operation, the Standard Oil cutting oil specialist serving your area of the Midwest has the cutting oil that will meet your needs. He has the experience and special training necessary to help you get better cutting oil results. How you can get his help easily and quickly is explained at the right. Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY

STANDARD

(Indiana)

Gasoline or food or people — whatever you're transporting, the cost per mile is less if vehicle bodies are made of *aluminum.*

Example: by adopting aluminum for truck bodies, an electric power company reduced fuel cost 5%, increased tire mileage 15%, and reduced license fees 50%.

Moreover, aluminum for truck or bus bodies is easy (thus economical) to form into the shape you want. It never rusts nor corrodes—thus maintenance expense is low. Being nonsparking, it's also safer.

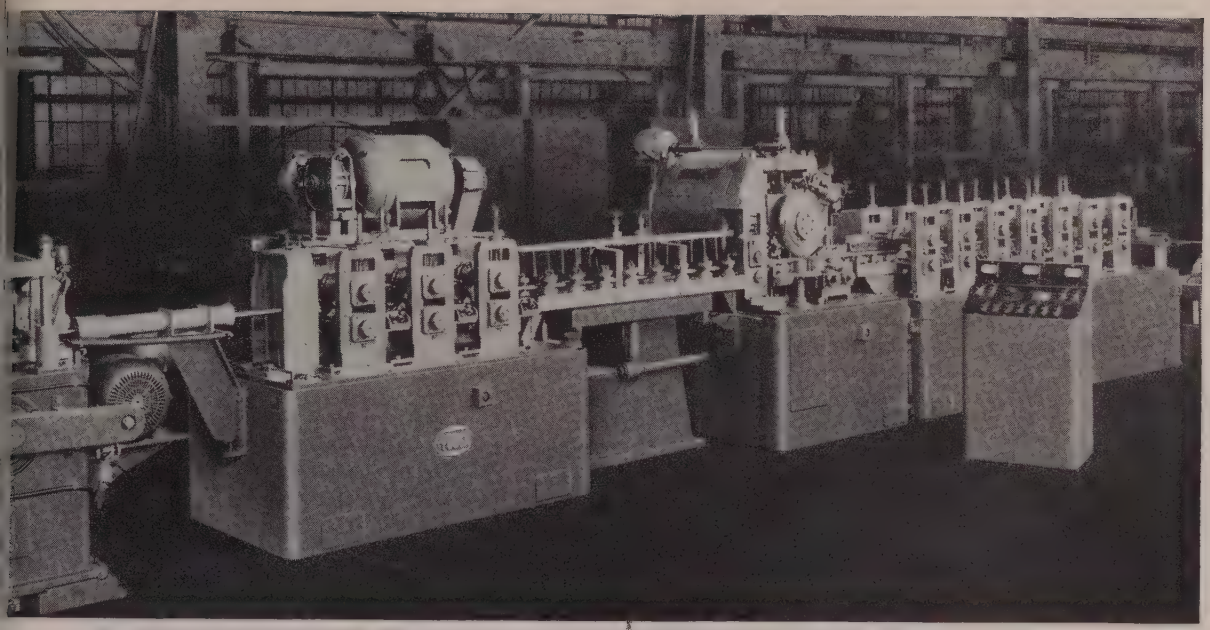
Aircraft, landcraft, watercraft — all types of vehicles benefit from aluminum. Aluminum makes them easier to build . . . lighter . . . longer-lasting . . . lower-cost to operate and to maintain.

Because aluminum has so many desirable properties, it's in great demand for transportation, military, and other essential needs. We're supplying millions of pounds of aluminum for security.

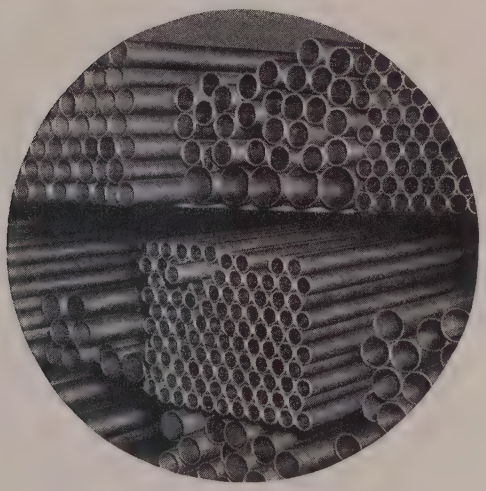
Although aluminum consequently is in short supply, we're doing our utmost to help relieve the shortage for all your needs.

ALUMINUM IMPORT
CORPORATION

Distributing company of the **ALUMINIUM LIMITED** *group, in the Western Hemisphere*
Offices and agents in 40 cities *Cable address: ALIMPORT*
630 Fifth Avenue, New York 20 • 20 North Wacker Drive, Chicago 6 • 505 Terminal Tower, Cleveland 13
510 West Sixth St., Los Angeles 14 • Av. Ing. Luis A. Huergo 1279, Buenos Aires • Rua Da Quitanda 96, Sao Paulo



Highest Output of



Quality Tubes

• Most manufacturers, when investing in an electric-weld tube mill, do so only after careful investigation, especially of performance records. Where, as often happens, records are available of the output and scrap losses of different mills, making comparisons possible, the choice of a Yoder is never in doubt. As a result, since their introduction in 1938, more Yoder mills have been installed in the U.S.A. and many foreign countries than electric-weld mills of all other makes combined.

In fact, the high quality and economy of tubing made in Yoder mills, have powerfully stimulated consumption and multiplied the uses for electric-weld tubing in the automotive, electric appliance, metal furniture and other mass production industries. The supply of such tubing, therefore, has never caught up with the demand.

Get the facts about Yoder mills, incorporating the latest developments in tube making, including the revolutionary new Yoder high speed induction welders for *non-ferrous as well as ferrous metals* and alloys.

THE YODER COMPANY
5502 Walworth Ave. • Cleveland 2, Ohio

Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS–cold forming and welding

ENGINEERING YODER MANUFACTURING

"We insist on high quality springs—without flaws; and we're getting them from American Steel & Wire"

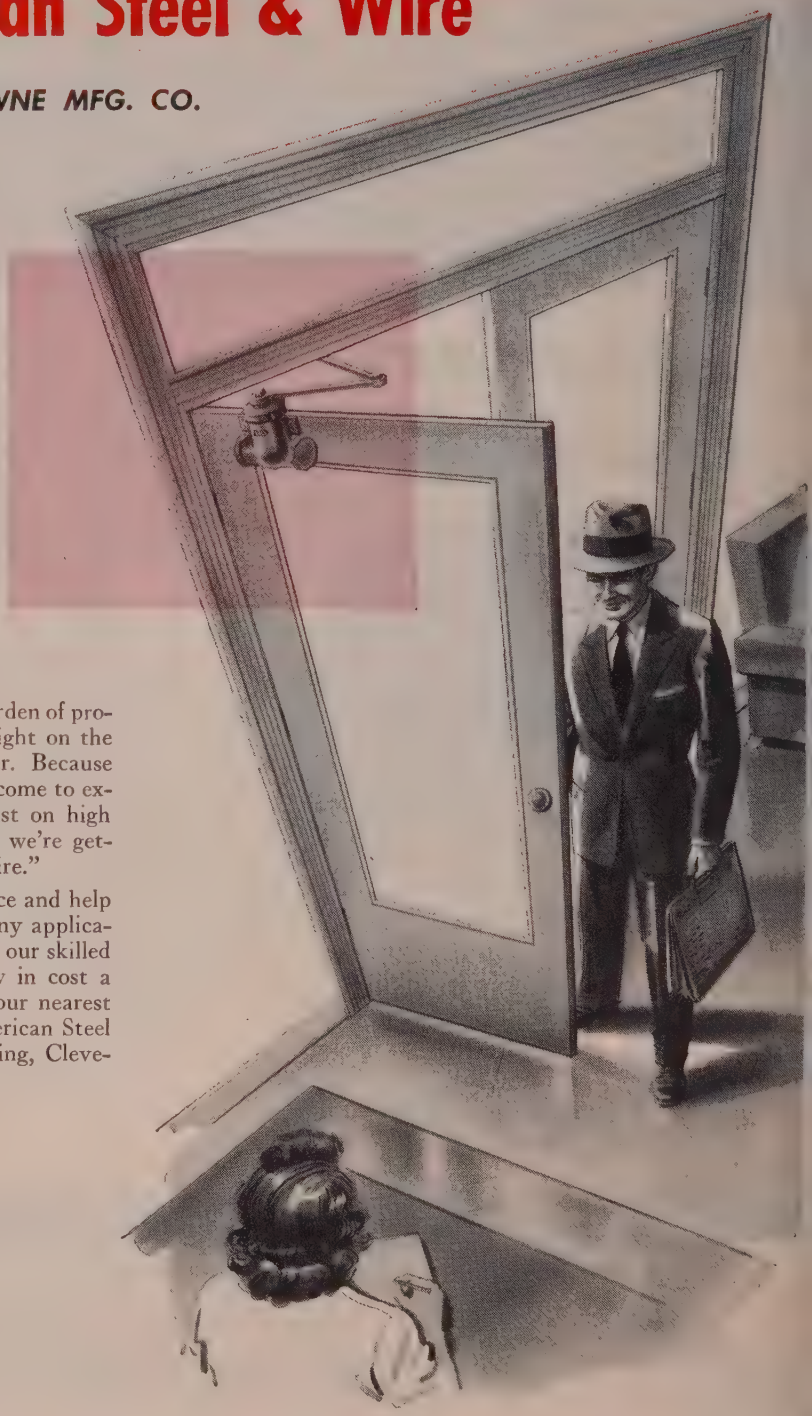
—SAYS THE YALE & TOWNE MFG. CO.

Yale Door closers are so reliable that nobody even *thinks* about them after they are installed. They're like brakes on a car: inconspicuous, yet they are expected to work every time without fail. Some of them, installed in public buildings, are flexed over 3½ *million* times in a ten year period.

A compact and powerful helical torsion spring is the heart of this famous door closer. It must deflect a full 150°, and store enough energy to return a heavy door against a strong wind.

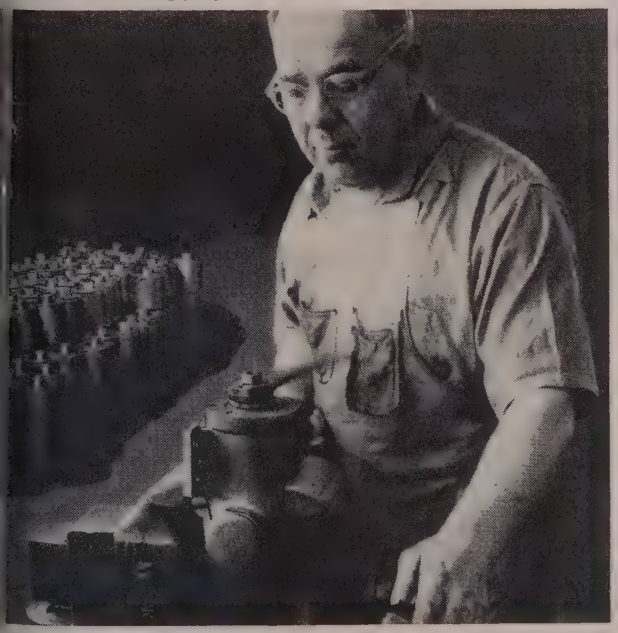
As Yale & Towne puts it: "The burden of producing a high quality spring falls right on the shoulders of the spring manufacturer. Because of the great service life people have come to expect from our door closers, we insist on high quality springs—without flaws; and we're getting them from American Steel & Wire."

American Steel & Wire can produce and help you design a spring for just about any application, any size, any steel or finish. Let our skilled spring engineers show you how low in cost a truly superior spring can be. Call our nearest District Sales Office or write to American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

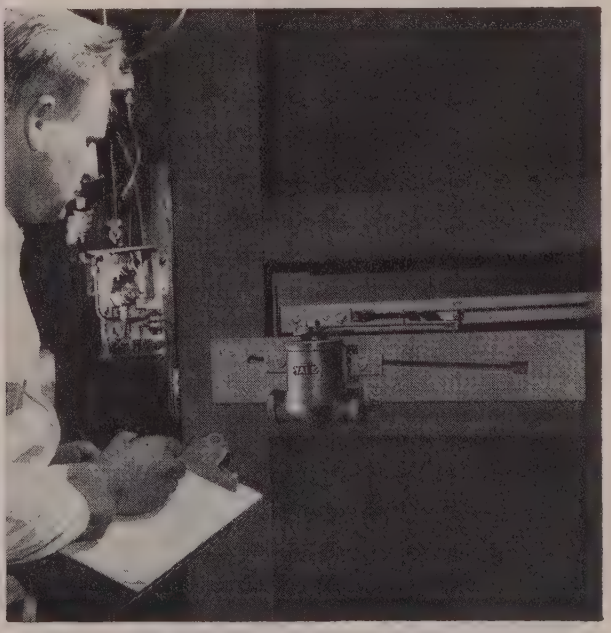


FIRST, the springs are dipped in a special graphite and tallow mixture that was developed by Yale engineers. Then the springs are capped with plates and made into a spring group.

HERE is the final spring assembly in the Yale & Towne #75 door closer.



THIS IS the final check on the completed door closer. A steel bar is used to tighten the spring, then the bar is abruptly released. If spring action is correct, the unit is ready to be shipped.



MANY quality control checks are made at Yale & Towne, including this endurance test. Here, a door is opened and closed repeatedly, simulating the operating conditions in a heavy traffic area.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS

TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

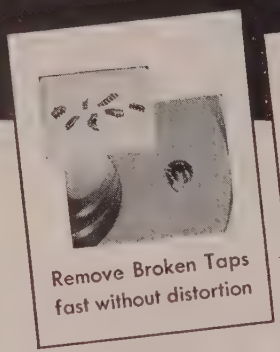
USS TRADE MARK

U·S·S American Quality Springs

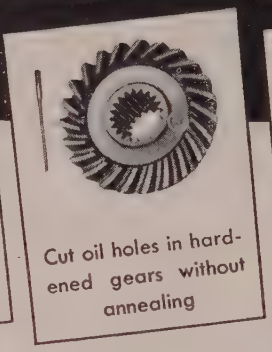
UNITED STATES STEEL

METAL DISINTEGRATION

and what it can do for you . . .

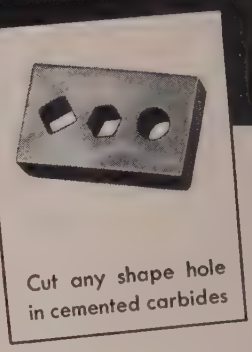


Remove Broken Taps fast without distortion

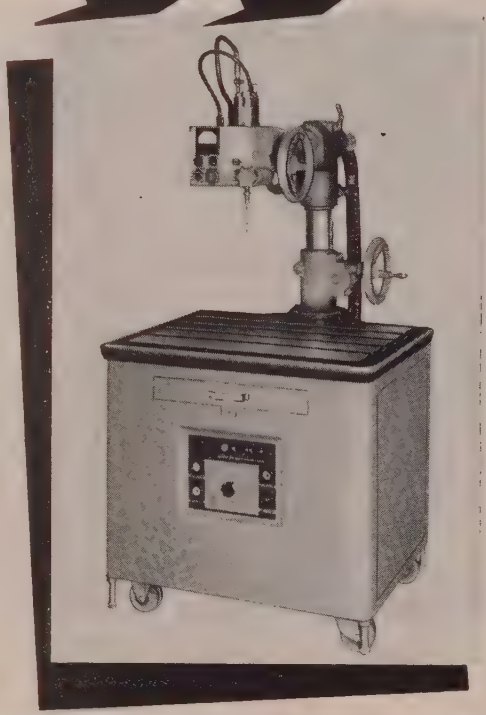


Cut oil holes in hardened gears without annealing

Cut dovetails in hardened dies



Cut any shape hole in cemented carbides



Literally hundreds of thousands of dollars are saved annually by corporations that are using Metalmasters in just tool and die repair alone.

There's a technical engineer in your area to give you an on-the-spot demonstration in your own plant at your convenience. (NOTE: It is not uncommon to pay for a Metalmaster with just one short demonstration thru savings on workpieces.)

For information as to the Metalmasters' uses and benefits merely write today on your company letterhead to:

Metalmaster

DIVISION OF CLINTON MACHINE COMPANY

CLINTON, MICHIGAN

The most widely used high temperature block insulation for over a quarter century...

SUPEREX® high temperature block insulation has long been industry's No. 1 choice for service temperatures up to 1900F. It provides *major* economies . . . reduces fuel costs, cuts heat losses, keeps maintenance expense down, costs less to install and has long service life.

These are the reasons why 90% of the nation's hot blast stoves are Superex insulated . . . and why the low cost open hearth steel producers use Superex in their regenerators.

Made of specially selected and calcined diatomaceous silica blended with other insulating materials and bonded with asbestos fiber, Superex will safely withstand temperatures up to 1900F with negligible shrinkage.

Superex has been used with outstanding success in all types of industrial and metallurgical furnaces and ovens, stationary and marine boilers, auxiliary power plant equipment, regenerators, kilns, roasters, high temperature mains, flues and stacks.

Superex has all these important advantages...

Low thermal conductivity—Exceptionally high heat resistance (1900F) combined with excellent insulating value.

Light weight—Approximately 2 lb per sq ft per in thickness.

Great physical strength—Approximately 6 tons pressure per sq ft are required to compress Superex ⅛ in.

Long, efficient service life—Superex maintains high insulating value indefinitely—will not disintegrate in the service for which it is recommended.

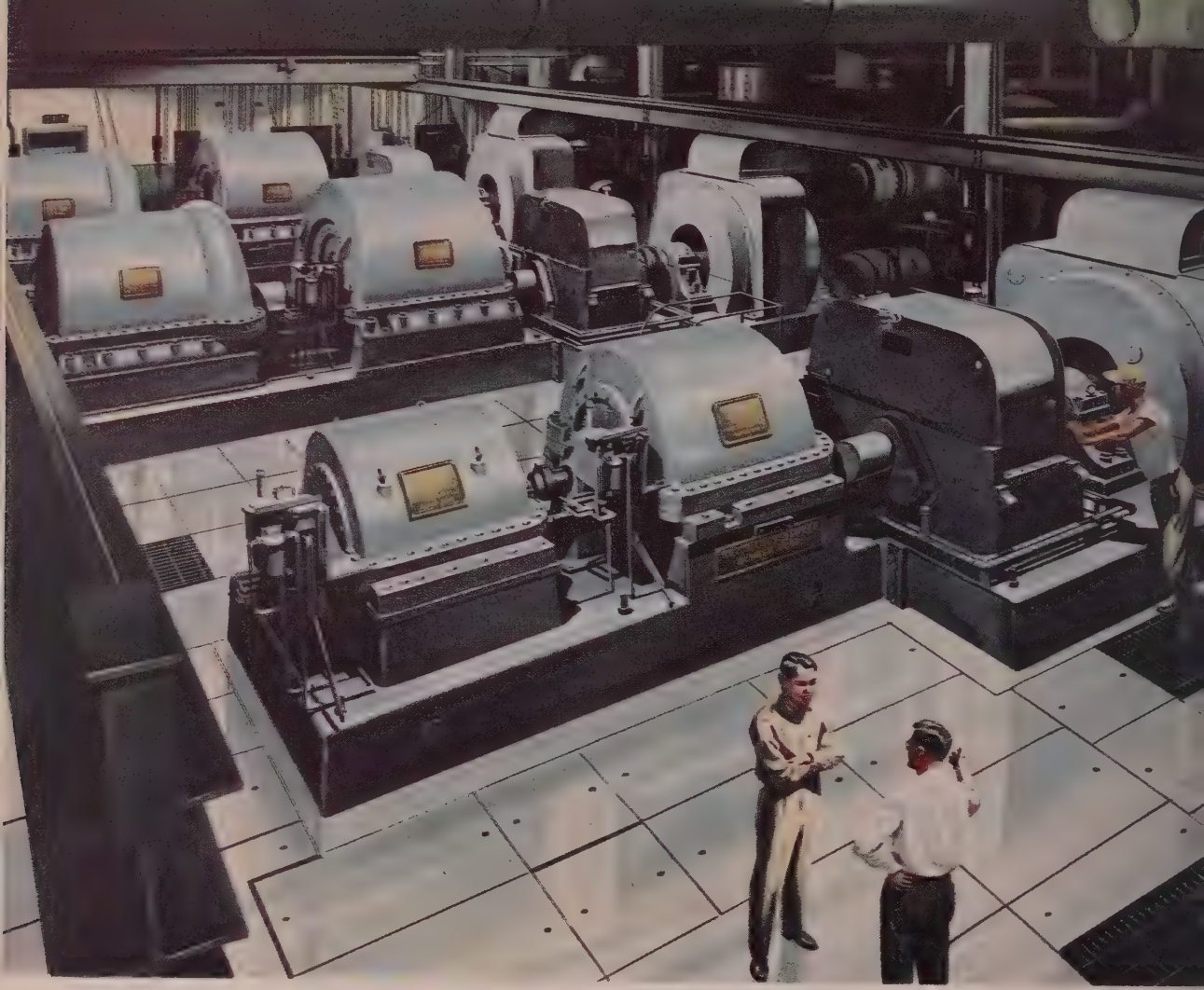
Fast, easy application—Superex may be cut with an ordinary knife or saw for fitting around openings or to irregular surfaces. Because of its light weight and convenient sizes, Superex assures fast and economical installations.

For complete information about Superex block insulation, write for Brochure IN-134A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, write 199 Bay Street, Toronto 1, Ontario.

Waste is minimized with Superex because of the variety of thicknesses available. Special shapes and intermediate thicknesses between those shown are also available.

JOHNS MANVILLE JM PRODUCTS

Johns-Manville *first in* **INSULATIONS**

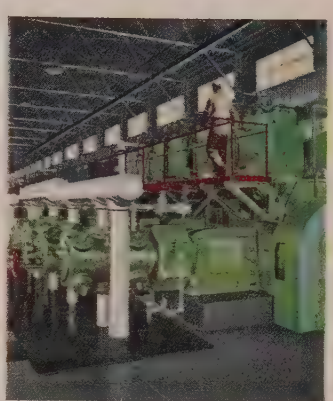


BLOWER BUILDERS R·C SINCE 1854

IS ONE OF THE DRESSER INDUSTRIES

In the movement of gas and air under moderate pressures, the oil and gas industries look to the acknowledged pioneer in this field, the Roots-Connersville Blower Division of the Dresser Industries. Serving almost every branch of industrial activity, Roots-Connersville continues today a tradition of leadership begun in 1854.

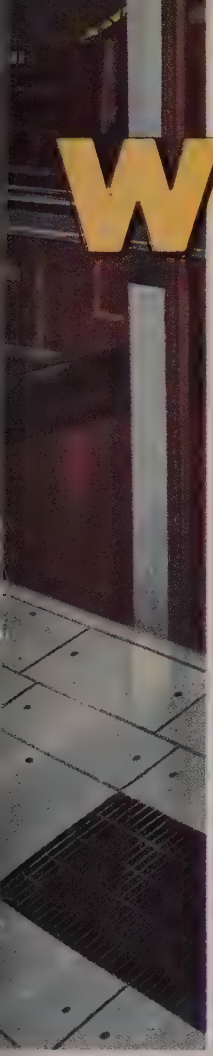
Magnet Cove Barium Corp., *Houston, Tex., Malvern, Ark., Greybull, Wyo.* Magcobar drilling mud, Magcogel bentonite, Mylojel, Fiber Seal, Jel-Oil mud.



Clark Bros. Co. Division, *Olean, New York.* Engines and compressors—gas, steam and diesel driven.

Dresser Manufacturing Division, *Bradford, Pa.* Oil and gas and pipe couplings, fittings and sleeves—rolled and welded rings—welding fittings and flanges.

Kobe, Inc., Division, *Huntington Park, Calif.* Complete hydraulic oil field pumping systems, including the Kobe Free Pump.



What is DRESSER INDUSTRIES

Dresser Industries, Inc. is one company—with the strength of many! A joint endeavor dedicated to producing the finest of integrated equipment and coordinated service for the oil, gas and chemical industries.

Each member company is an individual specialist and leader in its field. The parent, Dresser, incorporates many added services into its over-all administration, yet each company retains its individual identity and management. Such an integrated organization derives economies that are passed on to the operator along with the many other advantages of the specialized experience, know-how, research and development of each of these operating companies.

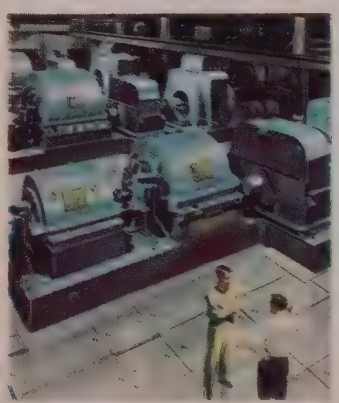
Dresser Industries is a vigorous, competent, far-reaching team to help meet efficiently the world's ever expanding energy requirements—a service unlimited—that makes your job easier, faster, more productive. This is your dividend from these combined operations—the DRESSER PLUS +

With its dual-ability line of both rotary positive and centrifugal blowers and exhausters, and an extensive range of gas and vacuum pumps, rotary positive displacement meters and inert gas generators, Roots-Connersville brings almost a century of specialized experience to industry's problem of moving gas and air.

DRESSER INDUSTRIES, INC.
OIL, GAS AND CHEMICAL EQUIPMENT

ATLANTIC BUILDING ★ DALLAS, TEXAS

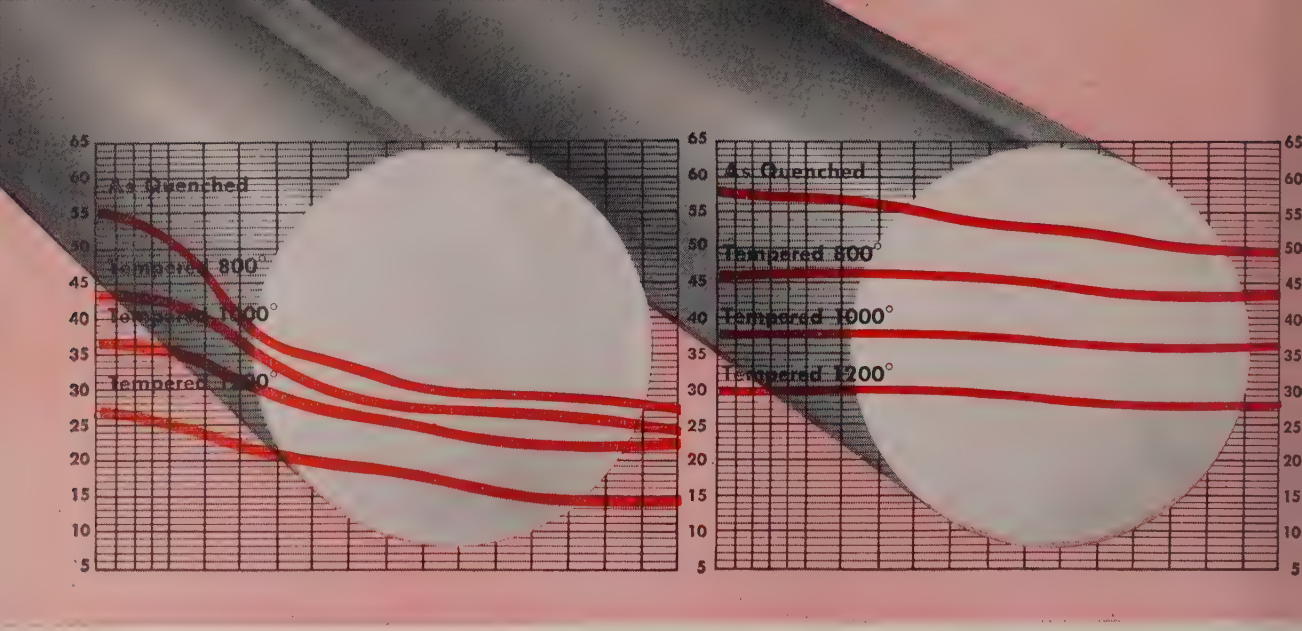
Pacific Pumps, Inc., *Huntington Park, Calif.* Centrifugal pumps, deep oilwell plunger pumps, hot oil and boiler feed pumps.



Roots-Connersville Blower Division, *Connersville, Ind.* Rotary positive blowers, gas pumps; centrifugal blowers, exhausters; positive displacement meters.

Security Engineering Division, *Whittier, Calif., Dallas, Tex.* Rock bits, reamers, casing scrapers, reamer rock bits, coring bits, Securaloy.

Ideco Division, *Dallas, Beaumont, Tex.* Derricks, drawworks, rambler drilling rigs, traveling blocks, rotary tables.



Same Alloy...but *What a Difference!*

Graphic Reason for Using Ryerson Certified Alloy Steel

Here are two bars of alloy steel recently purchased by a metalworking company. Both are the same type of alloy—AISI TS 4140 annealed. And both are high quality steels with chemistry meeting all the requirements of the specification.

But look at the difference revealed by hardenability tests!

The tempered-at-800° curves are typical. For the bar at left this curve starts at 44 Rockwell C and ends at 24. For the bar at right the same curve starts at 45—ends at 42. And the differences in hardenability naturally reflect equally marked differences in the mechanical properties that can be obtained from each bar.

Yet remember both bars are the same alloy and therefore are often expected to react in the same way. Their differences are only the normal variations that occur between different heats within the same specification.

That's why it is so important for you to specify and buy Ryerson Certified Alloys. *Every heat* of as-rolled and annealed alloy steel from Ryerson has been tested for hardenability in our own laboratory. When you receive a shipment of Ryerson alloys you also receive a Ryerson Alloy Certificate which shows exactly how *your particular heat of steel* responded to those tests. And the Certificate interprets the test results for you in terms of mechanical properties.

Thus you know the actual—not just the theoretical—hardenability of your alloy steel from Ryerson. And you know exactly how to heat treat that steel to obtain the desired properties. So why guess at hardenability? Use Certified Ryerson Alloys and be sure.

RYERSON CERTIFIED STEELS

PRINCIPAL PRODUCTS: CARBON, ALLOY & STAINLESS STEELS—BARS, STRUCTURALS, PLATES, SHEETS, TUBING, MACHINERY & TOOLS, ETC.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Metalworking Outlook

April 27, 1953

Prices Steady

The average industrial price level will hold steady for the next six months, although there will be individual shifts both up and down. The trend in nonferrous metals is down, in steel it's slightly up (see p. 157). Since Mar. 17 when the last price ceilings were cancelled, wholesale prices have remained at the same general level they held two months before, 6 per cent below the Korean War peak.

Exception in Machine Tools?

Machine tools may be one of the categories to rise in price sometime this year. The reason: With the defense program stretched out, the volume of builders' output will be down. They'll have to turn to the civilian market with its increased sales costs and requirements for new designs. Although redesigning will cost money, it will also increase the productivity of the equipment, points out Donald M. Pattison, sales vice president of Warner & Swasey Co. and former director of NPA's Metalworking Equipment Division.

Needed: Stability in Zinc

Zinc men attending the American Zinc Institute meeting in St. Louis this week will hear a plea for producers to stabilize prices to restore customer confidence in buying zinc. From last June to Mar. 28 the metal's price has changed 21 times, often, says industry, for little good reason. Price stability, many believe, will promote greater use of zinc for hot dip galvanizing of products and will encourage even more die casting. Die casters expect to consume 275,000 tons of the metal this year, compared with 204,000 in 1952 and 267,000 in 1950.

Question of Aluminum Tariffs

The present import tariff of 1.5 to 3 cents per pound on basic aluminum may be suspended for at least a year. Small Defense Plants Administration has asked the Treasury department to take the step on the grounds that it will help the 17,000 small firms fabricating and assembling the metal.

What Inflation Can Do

The Eisenhower administration's attitude toward antitrust prosecution will be far more reasonable than the Truman or Roosevelt outlooks, but there is one point which probably will be sharper now than formerly in sticking convicted violators. HR 2237, which has a good chance for passage, boosts the fine from $5000 to $50,000 for each count in a Sherman antitrust law conviction. Maybe it's just inflation.

Credit Standing: On the Mend

Your credit standing is improving. Accounts receivable generally were in better condition on Feb. 28 than on Nov. 30, 1952, and were,

Production-Engineering News—p. 99 The Market Outlook—p. 157

in most cases, returning to the status reported in February, 1952, says the Credit Research Foundation of the National Association of Credit Men. The number of accounts discounting or paying when due has increased, and the average age of all accounts has decreased.

The Heart of the Problem

The nub of the highway problem is this: 86 per cent of all vehicle traffic is concentrated on only 700,000 miles of the nation's system of 3.2 million miles. The trouble is that the overworked roads haven't been getting much more attention than the lazy roads. If peace comes in Korea, watch for a big surge in highway construction. Something will have to be done soon, what with the more than 52 million autos, trucks and busses now registered in the U.S., compared with 31 million in 1939.

Guaranteed Wage Hints

Worried about the guaranteed annual wage? If you are compelled to bargain on an employment guarantee, Dr. Waldo E. Fisher of the Wharton School of Finance & Commerce advises: Demand that the union also tackle the problem of regularizing employment directly; insist on joint fact-finding before any attempt at negotiations; point out that regularized employment gives relatively greater advantage to short-service employees than to long-time workers; limit any guaranteed wage or employment obligation to one year; and insist on making any guaranteed plan contributory.

Straws in the Wind

The National Security Council recommends U.S. participation in the St. Lawrence Seaway . . . S. Cong. Res. 8 introduced by Sen. Harry Byrd (Dem., Va.) would restrict contracting authority of federal departments by forbidding them to contract for delivery of materials or services during any fiscal year in excess of the prescribed limit on funds they can obligate for that year . . . Ford Motor Co. plans to build an estimated $60 million engine plant adjacent to its engine and foundry facilities in a Cleveland suburb.

What Industry Is Doing

Peace in Korea will be a good thing for business (p. 47) . . . Mergers of machine tool companies will probably increase as designs become more complex (p. 47) . . . A balanced budget may show up in 1954, despite tax cuts (p. 48) . . . Capacity to produce iron powder is expected to increase 200 per cent during the first half of 1953 (p. 49) . . . Scientific apparatus makers expect sales to ebb slightly in 1953 to $180 million (p. 50) . . . Industry must step up process research to match basic and engineering research (p. 52) . . . Makers of freight trailers may roll out an average of 70,000 units per year from now until 1956 (p. 54) . . . Research is charting the course of metalworking's destiny (pp. 55-62) . . . Sales of power home tools are continuing to gain velocity (p. 63).

Fabricating Steel is Our Business

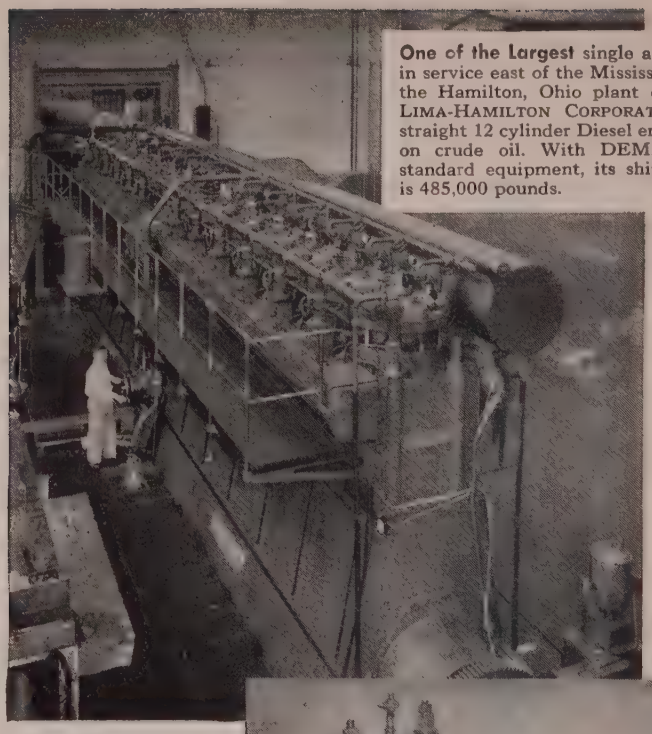
YOUR PLANS FOR THE FUTURE

Let an Ingalls engineer figure with you on your plans for the future. Our experience in the fabrication and erection of steel covers everything from bridges to blast furnaces. We fabricate all kinds of structural steel and plate work, and our ability to produce covers big, as well as little, jobs.

Ask Ingalls . . . your best bet for the many years ahead . . . to help you with your expansion plans.

The INGALLS Iron Works Company
BIRMINGHAM, ALABAMA

Sales Offices. New York, Chicago, Pittsburgh, Houston.
Plants: Birmingham, Ala., Decatur, Ala., Verona, Pa., North Birmingham, Ala., Pascagoula, Miss.



One of the Largest single acting engines in service east of the Mississippi. Built at the Hamilton, Ohio plant of BALDWIN-LIMA-HAMILTON CORPORATION, it is a straight 12 cylinder Diesel engine running on crude oil. With DEMA stationary standard equipment, its shipping weight is 485,000 pounds.

Nickel Alloys Help build stamina into an Engine that serves a city

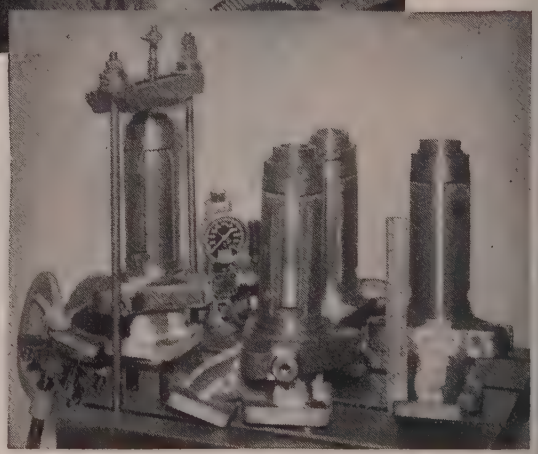
Built to handle the main power load for the city of Decatur, Indiana, this unit shows how nickel alloyed steels and irons are used in advanced design for increased power, quieter operation and longer trouble-free life.

Its forged crankshaft gear ... specified in Type 4340 or 9845 nickel alloyed steel ... provides:

Tensile strength	140,000 psi minimum
Yield Strength	118,000 psi
Elongation	16%
Reduction in area	45%
Brinell hardness	280 to 310

Piston heads are cast in high strength nickel-chromium iron to withstand heat stresses. Cylinder liners are one-piece castings containing .50% to .75% nickel and .25% molybdenum, for resistance to both heat and wear. Carburized nickel-molybdenum steel, Type 4615, is ordinarily specified for cams and rollers, and wrist pins are of Type 8620 nickel-chromium-molybdenum steel.

Consult us on the advantages of nickel in your products or equipment. Send us details of your applications for our suggestions.



Ductile Iron Gas Valve Bodies for HAMILTON Diesel engines undergo an 800-pound pressure test prior to assembly. Steel jackets are welded to these bodies with Ni-Rod 55. The castings are stress relieved for four hours, at 1200°F., and placed in service at 240 BHN. The Ductile Iron bodies prove sounder than those of cast steel, are easier to machine, and combine ample strength and ductility to withstand sudden pressure overloads.

At the present time, nickel is available for end uses in defense and defense supporting industries. The remainder of the supply is available for some civilian applications and governmental stockpiling.

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Magnificent Challenge

In the days when the United States and the Soviet Union were allies in World War II, representatives of our War Production Board frequently went to Moscow to confer with their opposite numbers. On occasion, they talked with the late Joseph Stalin.

Among stories they brought back to Washington was one to the effect Stalin was worried over the sacrifices made by the Russian people. He was quoted as saying that as soon as the war was over, the Kremlin would be obliged to do something to improve the standard of living of the people. Otherwise, the hold of Soviet leaders over the citizenry would be endangered.

Nobody knows whether or not Stalin was sincere in these statements. It is significant that even he recognized the need for butter as well as guns in the Soviet economy. Also, it is apparent from the scanty information that leaks through the iron curtain, that the well-being of the average individual in the Soviet Union has improved little, if at all, during the past three decades.

Therefore, if a way could be found to end present world tensions, people in the Soviet Union should stand to profit even more than citizens in many other nations. This fact lends great force to President Eisenhower's address of Apr. 16 to the American Society of Newspaper Editors.

He pointed out that the road the world has been following during the past eight years can lead only to atomic war or a continued life of "perpetual fear and tension." The new leadership in the Soviet Union has a "precious opportunity . . . to help turn the tide of history." Should it see the light and do the right thing, then the world can devote its energies to a new "declared, total war, not upon any human enemy, but upon the brute force of poverty and need."

The tremendous appeal of the President's address lies in the fact that it suggests a formula for the new leaders in the Kremlin that might suit their needs more effectively than would a continuation of Stalin's policies. The world awaits the Soviet's response to a magnificent challenge.

E. C. Shaner

EDITOR-IN-CHIEF

DIVERSIFIED RESEARCH: An extremely important factor in the rapid progress of American industry is research. We do not have to go back many years to the time when the limited amount of research in this country was conducted on sort of a hit-or-miss basis. Much of it came about through the zeal of a few enthusiastic pioneers.

Their work was important, because it demonstrated what research can do for industry. As

the volume of research activity increased, there arose an increasing need for placing it upon a more systematic basis. As a result, today we have organized research (pp. 55-62) which is capable of meeting the requirements of any company.

Of course, the larger corporations may wish to maintain their own laboratories and technical personnel, but there are four alternatives. Companies—large or small—are finding it advantageous to rely upon commercial laboratories and consulting firms; industrial laboratories; universities and their research affiliates, and research institutes and foundations. The flexibility and wide range of these services are a national asset.

* * *

CREATES NEW INDUSTRY: Perhaps some manufacturers could get valuable clues for new market possibilities by studying what the American people do in their spare time. This thought is prompted by the spectacular growth in the demand for power-driven tools for home workshops. The inclination of home owners to do things for themselves instead of hiring somebody to do it for them has created a healthy new industry (p. 63)—largely within the last decade.

Apparently the demand for equipment for the home workshop stems from the shorter work week, which gives the worker more time at home, and from the really remarkable increase in home ownership in recent years. An even more important factor may be that many professional craftsmen have priced themselves out of their market. As one observer puts it, "a $75-a-week worker cannot afford to hire a $150-a-week professional."

* * *

TIMELY BACKTRACKING: Secretary of Commerce Sinclair Weeks used good judgment in checking the bet on his earlier impetuous decision to oust Dr. Allen V. Astin from his position of director of the National Bureau of Standards. Also, hundreds of individual scientists and numerous scientific societies deserve credit for protesting vigorously enough to cause the secretary to backtrack and to possibly correct what would have been a serious mistake.

There may be some justification for Mr. Weeks' feeling about the bureau's work in connection with the Federal Trade Commission and the Post Office Department. However, this is a minor part of the bureau's scientific functioning. In building too much of a case on this fringe activity, Secretary Weeks came dangerously close to destroying the bureau's prestige in its more important fields of scientific activity.

In view of what has happened, the secretary will do well to be sure he has all the facts before he makes any more moves affecting NBS.

* * *

66 ARE BILLIONAIRES: A survey by United Press shows that there are 66 business enterprises in the United States each having assets exceeding a billion dollars. Membership in the "billionaire club" has more than doubled in the last 11 years.

Most of the 66 are banks, insurance companies, oil producers, railroads and public utilities. Only nine are in the metalworking field. General Motors Corp. stands tenth in the list, with seven banks, the Bell system and Standard Oil (N.J.) ahead of it. United States Steel is 14th, Du Pont 20th, Bethlehem Steel 38th, Ford Motor 39th, General Electric 41st, Westinghouse Electric 58th, Union Carbide 61st and International Harvester 62nd. Carbide and IH were newcomers to the club in 1952.

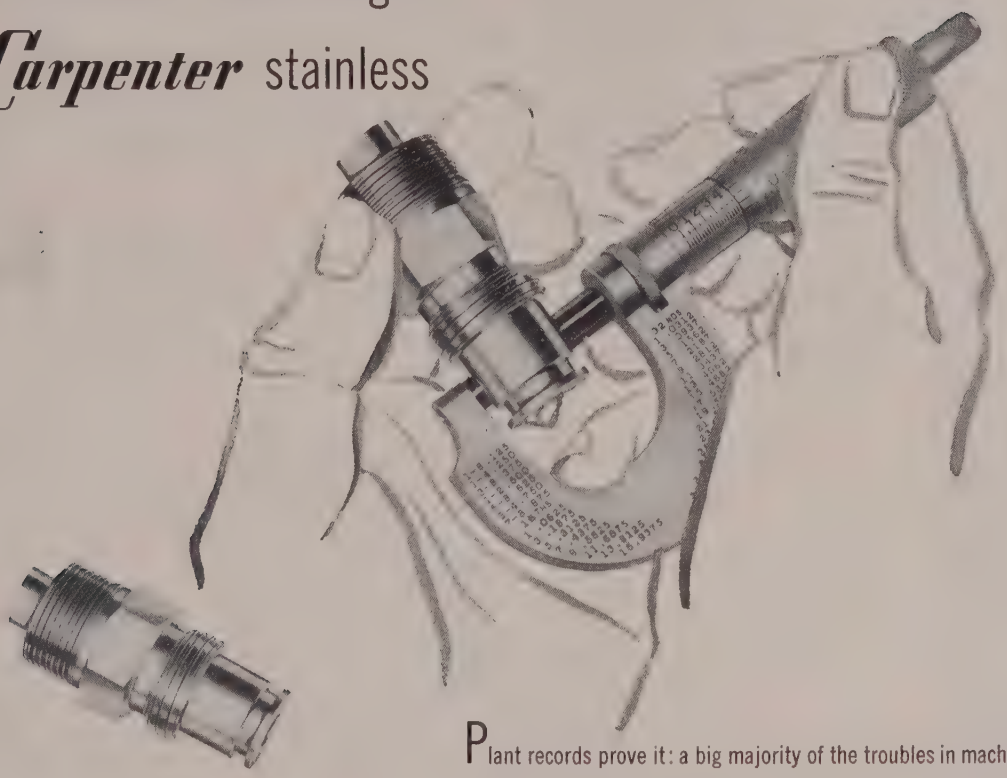
Why is it that critics of "bigness" usually lambaste some of the nine manufacturers, whereas there are 57 nonmanufacturers as big or bigger?

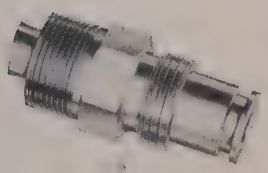
* * *

HOW MUCH MEDICINE? Frederick S. Blackall Jr., president of the American Society of Mechanical Engineers, has entered the debate on the tariff problem. He favors the principle of free trade, but advises caution. He says that some application of the medication proposed by Henry Ford II (abolish all tariffs, abolish all immigration quotas, banish the buy American program and simplify customs restrictions) "would be salutary (p. 67), but in more limited and carefully directed doses than he seems to envision. Ten grains of aspirin may cure a headache, but the whole bottle may kill you."

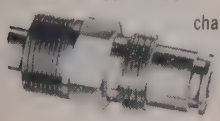
The delicate problem which Messrs. Ford, Blackall and others have been discussing is of the utmost importance. How to facilitate the flow of goods between nations without impairing the living standards in countries where wages are high is a challenge to the world's ablest experts.

You get a far higher number of **good ones** on each run when machining *Carpenter* stainless





Rejects on this needle valve part dropped 30% when the company changed to Carpenter No. 8, Type 303.



Plant records prove it: a big majority of the troubles in machining stainless parts just aren't necessary! That's why we'd like to show you what can happen when you change from a run-of-the-mill free-machining stainless to a Carpenter Free-Machining grade. Records prove that on many jobs, rejects take a nosedive, tool life goes up, and costs down. That's because Carpenter Stainless is made in a specialty tool steel mill to highest tool steel quality standards. The same careful controls are applied to make sure every bar of Carpenter Stainless will work the same. It stands to reason that with Stainless like this you can get more good parts out of the lot. Isn't it worth a try? Just specify "Carpenter" on your next production order. The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.

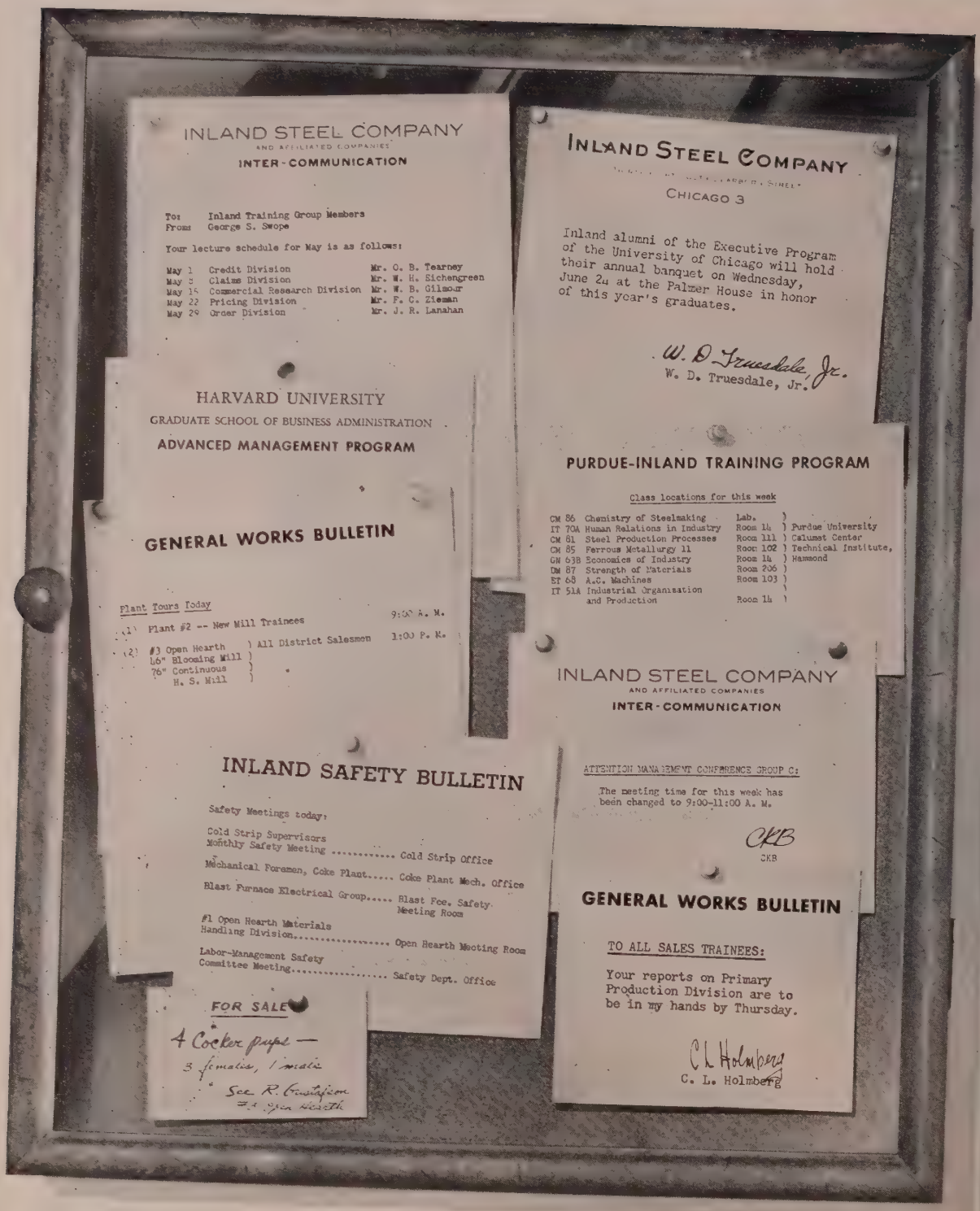
Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter STEEL

Free-Machining Stainless

takes the problems out of production

Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor


INLAND STEEL COMPANY
AND AFFILIATED COMPANIES
INTER-COMMUNICATION
To: Inland Training Group Members
From: George S. Swope
Your lecture schedule for May is as follows:
May 1 Credit Division Mr. O. B. Tearney
May 8 Claims Division Mr. W. H. Sichengreen
May 15 Commercial Research Division Mr. W. B. Gilmour
May 22 Pricing Division Mr. F. C. Zieman
May 29 Order Division Mr. J. R. Lanahan
INLAND STEEL COMPANY
CHICAGO 3
Inland alumni of the Executive Program of the University of Chicago will hold their annual banquet on Wednesday, June 24 at the Palmer House in honor of this year's graduates.
W. D. Truesdale, Jr.
W. D. Truesdale, Jr.
HARVARD UNIVERSITY
GRADUATE SCHOOL OF BUSINESS ADMINISTRATION
ADVANCED MANAGEMENT PROGRAM
PURDUE-INLAND TRAINING PROGRAM
Class locations for this week
CM 86 Chemistry of Steelmaking Lab.
IT 70A Human Relations in Industry Room 14) Purdue University
CM 81 Steel Production Processes Room 111) Calumet Center
CM 85 Ferrous Metallurgy II Room 102) Technical Institute,
GN 63B Economics of Industry Room 14) Hammond
CM 87 Strength of Materials Room 206)
ET 68 A.C. Machines Room 103)
IT 51A Industrial Organization and Production Room 14)
GENERAL WORKS BULLETIN
Plant Tours Today
(1) Plant #2 -- New Mill Trainees 9:00 A. M.
(2) #3 Open Hearth) All District Salesmen 1:00 P. M.
44" Blooming Mill)
76" Continuous)
H. S. Mill)
INLAND STEEL COMPANY
AND AFFILIATED COMPANIES
INTER-COMMUNICATION
ATTENTION MANAGEMENT CONFERENCE GROUP C:
The meeting time for this week has been changed to 9:00-11:00 A. M.
CKB
CKB
INLAND SAFETY BULLETIN
Safety Meetings today:
Cold Strip Supervisors Monthly Safety Meeting ..... Cold Strip Office
Mechanical Foremen, Coke Plant..... Coke Plant Mech. Office
Blast Furnace Electrical Group..... Blast Fce. Safety Meeting Room
#1 Open Hearth Materials Handling Division..... Open Hearth Meeting Room
Labor-Management Safety Committee Meeting..... Safety Dept. Office
GENERAL WORKS BULLETIN
TO ALL SALES TRAINEES:
Your reports on Primary Production Division are to be in my hands by Thursday.
C. L. Holmberg
C. L. Holmberg
FOR SALE
4 Cocker pups —
3 females, 1 male
See R. Gustafson
#3 Open Hearth

A modernization and expansion program for people is going on at INLAND, too!

INLAND STEEL COMPANY
38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago, Milwaukee, St. Paul, Davenport, Kansas City, St. Louis, Indianapolis, Detroit, New York

Business Ready To Welcome Peace

Decline in military work anticipated by screw machine products manufacturers. Shift to more civilian work will prompt greater sales effort, more attention to costs

PEACE in Korea will be a good thing for business.

That opinion comes from representatives of companies ranging from big to little—from Robert Chestnut of Aluminum Co. of America, Edgewater, N. J., to Daniel Klaus of the 50-employee Milwaukee Machine Products Co., Milwaukee. That opinion, too, ranges throughout an industry, screw machine products, which is a good sounding board for general metalworking's feelings about a possible decline in defense spending because currently about half its volume is going for defense and because its diverse products are used as components by virtually every segment of metalworking.

More Realistic—Most of the delegates to the National Screw Machine Products Association's annual meeting in New York last week agreed that peace in Korea will mean curtailed defense expenditures and less military work for them. "But that's as it should be," says John S. Higgins of Whittet-Higgins Co., Providence, R. I. "It will put us on a more realistic footing."

Association President A. W. Bonner of M. B. Fetcher Co., Detroit, and the majority in his industry believe they can get more "realistic" through improved employee incentives, better selling.

Nearly all of the 1500 companies in the industry are stepping up their sales efforts as a way to shift to more civilian activities when defense work lags. But few think that defense spending will drop off to nothing in years to come for themselves or other metalworking industries. For example, ammunition output is a big defense activity for screw products manufacturers, and they think that the current investigation of the alleged ammunition shortage will stimulate production for some time, Korea or no Korea.

Insurance—Even so, many manufacturers in the industry are already carefully emphasizing civilian activity more. Such a producer is Leonard Shaffer of Mechanical Art Works Inc., Newark, N. J., who is deliberately limiting defense work to 20 per cent or less of his production. "And even my current 18 per cent for the military could be soon replaced with civilian jobs if necessary."

For the moment, civilian prospects for the screw machine manufacturers are excellent. N. A. Hewitt of Ohio Screw Products Inc., Elyria, O., believes his company "will be producing at capacity the next six months, anyhow." Backlogs for many companies average about four months. No one has serious problems getting brass and aluminum, and steel difficulties are easing steadily.

Test Run—While optimisim for the short-term is good, it's more tempered for the long pull. Screw products people did $71 million in business in 1938 and are producing at an annual rate of $450 million today. So, they have a much bigger capacity to keep occupied now.

They believe that the mild shakeout coming now because of curtailed defense expenditures will prove a fine trial run. It will get them in shape for the more severe shakeout they foresee in 1954 when increased productivity and harder selling can carry them through.

Tool Builders: Fewer but Bigger

"The period following the Korean war should see some of the smaller machine tool companies being absorbed by several of the larger ones." That was a prediction made by Jerome A. Raterman, president of Monarch Machine Tool Co., Sidney, O., at a meeting of the Cleveland Society of Security Analysts in Cleveland last Wednesday.

Reasons on both sides indicate that the merging will occur. From the standpoint of the small companies, the ever increasing complexity of machine tools means steady increases in overhead. A few years ago the machinists and engineers could handle almost every phase of the business. Now the need for electronic specialists and experience, knowledge of metallurgy and other subjects have complicated the field. All the signs point to further increases in complexity as new designs go on the boards.

At the same time some of the large companies will be looking

for new lines to diversify their output. Logically, in many cases the search for new lines will stay within the machine tool industry. That's the way the existing facilities and experience, as well as interest, can be put to work on new products.

"It boils down to a scene of fewer, but bigger and stronger, machine tool companies," Mr. Raterman said.

A Balanced Budget Near?

It comes closer as reduced budget requests reach Congress. Most heartening indicator thus far: A 61 per cent cut in the First Independent Offices Appropriations bill

THE FEDERAL BUDGET picture begins to look bright. Washington wisemen, who only a few weeks ago were questioning the ability of the new administration to fulfill its budgetary reform promises in time to show up in fiscal 1954, now make these predictions:

By July 1 government expenditures and income will be approximately in balance for the year then beginning. This will be accomplished despite loss of the excess profits tax—which will be allowed to expire in June. Also, the administration and congressional leaders will agree to some reduction in individual income taxes as of July 1.

The Ax—Adding a touch of lighter hue is the House Appropriations Committee cut of the First Independent Offices Appropriations bill (first 1954 money measure to come from the committee) by 61 per cent. It calls for spending $451 million, or $721 million less than recommended in the January Truman budget request. This bill went through the House handily, and a canvass indicates that the Senate will go along.

The 61 per cent cut in the above bill comprises not only many actual savings due to abandonment of projects which would have cost money, but a large number of "stretchouts." The stretchout device, for example, has been used by the administration in cutting the civil works request 28 per cent, providing for completion in five instead of the initial three years. Other projects, like the proposed Kootenai dam, were knocked out and dubious ones held out for re-examination.

Defense Cut—While the all-important Defense department is not due to submit its 1954 budget until after May 15, the recommendation as it now stands calls for a reduction of $4 to $5 billion from the Truman request. But the cut could be a great deal more in the event of successful peace negotiations in reference to Korea which alone is costing us $5 billion a year.

In the meantime, recommendations for reforms continue to come out or are being finalized. A task force is about to come up with proposals for wiping out the $700-million Post Office department deficit.

Civil Service Commission estimates that on the basis of economies so far effected or proposed the federal government will have some 240,000 fewer names on its payrolls on June 30, 1954, than at present.

Tax Reforms Proposed

NICB hears educator, insurance researcher, industrialist tell what to do about tax structure

REVAMP the federal grants-in-aid program; reconsider taxes in the light of their effects on savings and private investment; work toward elimination of the progressive tax structure: Those were three views presented to the National Industrial Conference Board Inc. at a special tax conference in New York on Apr. 16.

John E. Burton, vice president of Cornell University; Donald B. Woodward, vice president for research, Mutual Life Insurance Co. of New York; and Fred Maytag II, president, Maytag Co., Newton, Iowa, were the main speakers at the dinner session.

Indirect Control—Mr. Burton, former director of the budget for New York state, used the federal grants-in-aid program to illustrate how federal government exercises its influence over the fiscal policies of the lower governments.

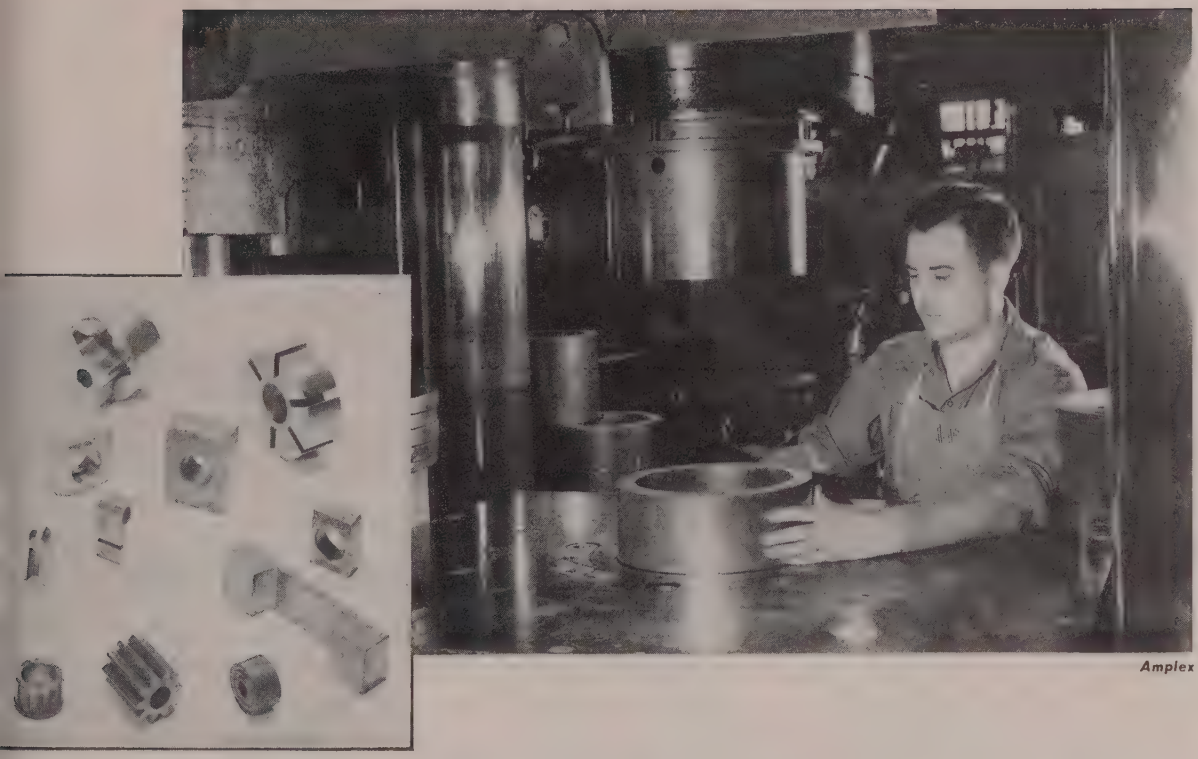
He admits to the good points of central assistance to lesser governmental units. But he believes that the program should be simplified and consolidated with a permanent federal-state agency to review and arbitrate the questions of general state compliance. Furthermore, federal appropriations should serve as "ceilings to accomplish stated purposes," not simply orders to spend as much as possible. Such steps would reduce the total of federal grants and take the federal government out of tax fields suited to state administration, Mr Burton said.

Increased Production—"Production per head can continue to be increased by something like 2½ per cent per year compounded if savings and private investment are continued unimpaired," Mr. Woodward told the meeting. He proposed that taxation on savings and investment should be reduced, "even if it is necessary to increase taxes upon consumption to achieve it."

He was particularly disturbed about the double taxation of corporate income—once at the corporation level and once at the stockholder level—and by taxation on institutions and instruments serving as intermediary handlers for savings and investments.

Favors Expiration—Mr. Maytag went on record as favoring the scheduled expiration of the excess profits tax, despite the loss of revenue. He said the two broadest bases for taxing the people's earnings are income tax and consumption taxes. His proposal would wipe out all selective excise taxes, except tobacco and liquor, and replace them with a uniform excise tax at a low rate. "We should be concerned not only with tax rates but also with the kinds of taxes which are imposed," Mr. Maytag stated.

He also proposed reduction of personal income taxes and an attack on the progressive element of the rate structure. The latter suggestion would distribute the tax burden more evenly among all the people, he believes.



Amplex

Metal Powders Grow: Can Uses Keep Up?

BY MID-1953, iron powder producing capacity in the United States and Canada will have increased by nearly 200 per cent over the capacity at the beginning of the year. American manufacturers, primarily by means of new plants now being completed, will have a capacity of more than 10 million pounds per month of iron powder. One plant alone will produce 5 million pounds per month.

Can applications keep up with this expansion in powder production? Manufacturers of fabricated parts from powders think so. That is the consensus that prevailed at the Ninth Annual Meeting of the Metal Powder Association held at Cleveland, Apr. 21-22.

Here's Why—Powder metallurgy is being used more and more in manufacture of many products. Reason: Real cost savings result from this automatic high speed production method. Parts such as porous self-lubricating bearings, carbon brushes, insulators, Alnico magnets, carbide tool bits, magnetic radio cores, contact buttons, gears, cams and many other finished machine parts are produced accurately and automatically.

Take National Cash Register Co., Dayton, O., for example. It now has more than 90 precision iron powder parts for business machines in production and is tooling up for more. An average of over 700,000 powder metallurgy parts per week are produced. Some parts are actually stronger than the same parts made previously from steel bar and strip. Surface finishes can be held to a micro-inch value comparable or better than ground surfaces.

Tool costs, both initial and for maintenance, have been reduced to the point where it is profitable to produce even low usage parts by powder metallurgy methods. Manufacturers report that scrap losses are held to a minimum; losses of only one in a million are not unusual—due generally to breakage which occurs during handling.

Where It Goes—An industry-wide survey made by the Metal Powder Association shows that about 60 per cent of present iron powder production goes into manufacture of bearings and mechanical parts, about 28 per cent is being used for scarfing and some 10 per cent for electronic applications.

Powder metallurgy is an economical way to produce large diameter nonferrous parts such as bronze bearings, now regularly produced in sizes of from 4 to 8 inches in diameter with special sizes as large as 20 inches being produced. Other examples: Filters, flame arresters and clutch friction facings.

Differential in metal costs between nonferrous powders (brass, copper, bronze and nickel silver) and equivalent alloys in cast or wrought forms is not great. In many plants cost savings are in favor of sinterings because direct labor costs are relatively low and because it is possible to eliminate expensive machining operations or avoid scrap. Tubular lock cylinders, faucet handles and many types of gears and cams now made from pressed brass are examples of such savings.

Aluminum Too—More aluminum powder sinterings are being used. An unlubricated aluminum compact can be sintered in a variety

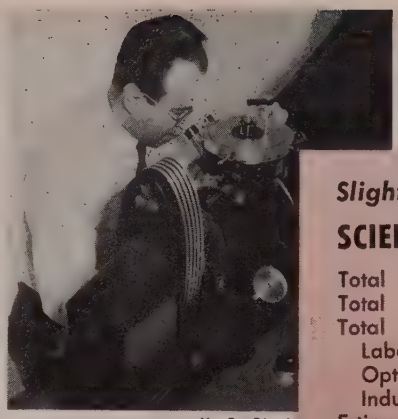
of atmospheres, including still air, to develop physical properties close to the mechanical properties of wrought metal. Aluminum powder is produced in larger tonnages than any other metal powder today. Large quantities go into manufacture of aluminum pigments and as an ingredient in high explosives. Sintering grade is available at only 50 per cent more than the cost of metal. Producers are eyeing the sintering market in their expansion plans.

Stainless Powders — Prealloyed stainless steel powders are available in grades 302B, 316, 318, 318Si, and 431. They are readily moldable and can be sintered at temperatures as low as 2100° F in a hydrogen atmosphere, to produce a variety of mechanical or corrosion resistance parts.

No Hold-up Here—Builders of presses too are moving forward. Many new types are being produced. Some are hydraulic and others are mechanical. Improvements include greater strength, sturdiness, flexibility and means for fast and easy set-up. Equipment in plant use ranges from relatively rapid mechanical action units in the 4 through 100-tons range up to 1000-ton hydraulic units which operate on slower cycles. Combination mechanical-hydraulic machines are used for parts in the medium to large size range.

Future — Here's what industry leaders predict: Greater use of powder metallurgy products of ferrous base, a demand for parts of larger size, and increased requirements with regard to physical properties. Look for more demand for special parts. These include high physical properties and resistance to corrosion and high temperature. Fabricators and powder producers alike feel that the establishment of standard powder specifications will be an aid in expanding applications.

Thomas R. Moore, General Dyestuff Corp., New York, was elected to head the Metal Powder Association for 1953-54. Ernest H. Klein, New Jersey Zinc Sales Co., New York, retiring president, was chosen chairman of the board of directors. Robert L. Ziegfeld was re-elected secretary-treasurer.



U. S. Steel

Slight Ebb in a Flood Tide for

SCIENTIFIC APPARATUS SALES*

Total 1950	$122 million
Total 1951	$167 million
Total 1952	$200 million
Laboratory Apparatus	123 million
Optical Instruments	15 million
Industrial Instruments	62 million
Estimated 1953	$180 million

* Except recorder-controller sales

Scientific Apparatus: Another Good Year

Though down from all-time peaks, sales of apparatus should hit $180 million in 1953. Industrial research demands are expected to replace any defense lag

INDUSTRIAL research and development work has become long-term business insurance for scientific apparatus manufacturers.

Last year the nation as a whole spent more than $3.5 billion on research and development, two-thirds of which was done by private industry (see p.55). Heightened competition for civilian markets in any defense-defrosting period would strengthen the need for accurate measuring and testing devices.

Two-way Winner—So either way, with defense work or without, scientific apparatus makers are confident they will continue their overall upward sales trend (see chart). As the chart above shows, however, they expect this year to be down a bit from 1952.

To illustrate how small this slippage will actually be, the recorder-controller section of the Scientific Apparatus Makers Association says that 1952 business was down 10 per cent from 1951, the all-time peak, and that 1953 business will only be as good as 1952 at best. But, on the basis of revised figures for 1951, that year was 3000 per cent better than 1935.

Many Small Ones—About 1600 companies make scientific apparatus, though many of that number employ fewer than 25 workers. These firms produce more than 20,000 different types of apparatus, instruments and equipment, not including 12,000 to 15,000 kinds of reagents and various kinds and sizes of stoppers, corks, etc. The average dealer will handle about 10,000 items which would make up perhaps 1000 different major pieces of equipment.

Deliveries are generally improved, reflecting easier materials supply (nickel and nickel-bearing stainless being the most important exceptions). "We're quoting 30 days and pretty well maintain delivery, not only on our own equipment, but equipment of other manufacturers," says Harry Huck, sales manager, Burrell Corp., Pittsburgh. Recorder-controller equipment had a 14-month waiting period in 1951 which dropped to 6 to 8 months in 1952 and to less than 6 months early this year.

Delivery Problems—Despite the changing-to-favorable delivery picture, scientific apparatus makers say deliveries are among their biggest problems. With costs and prices high, time has become an important consideration in sales; quick delivery is often the controlling element. That doesn't apply to the hotter selling items such as electronic classifying equipment where demand still outruns supply, nor to some of the extremely com-

licated equipment which these rms produce.

Up to now imports of foreign-ade apparatus have engendered ttle friction in the domestic in-ustry. The surplus of war orders upplied ample lubrication. But, he wheels are beginning to squeak little now and more can be ex-ected if the tariff-cutters get their vay in the apparatus field. Certain ategories of apparatus — micro-copes, analytical balances and ptical instruments—feel crowded y foreign makes much more than thers.

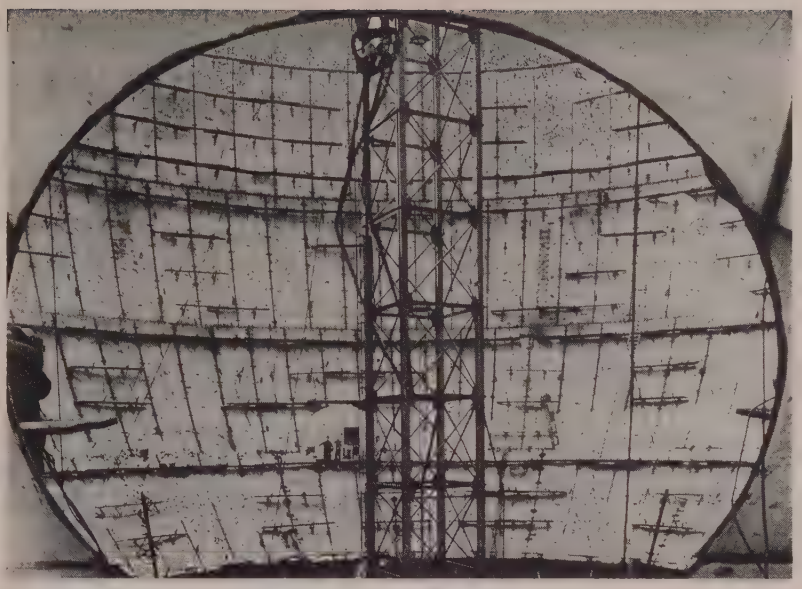
Close Contribution—Kenneth An-lersen, vice president of the Sci-ntific Apparatus Makers Associa-ion, called the "Trade, Not Aid" heory "a catch phrase with a atch in it." The idea doesn't take nto account the contribution of American apparatus makers to the present pre-eminence of the U.S. n technology, he said. "It's hard o rely upon a foreign supplier for a piece of apparatus that is needed for a research project today, which may determine our destiny as a country tomorrow."

Recognizing the growing impor-tance of foreign producers, SAMA plans to convert its national exhibit of scientific apparatus makers this fall in Philadelphia into an in-ternational exhibit. Foreign manu-facturers have been invited to at-tend.

ODM Issues Write-Offs

Certificates of necessity were issued for 232 new or expanded facilities valued at $245.7 million in the two weeks ended Apr. 8, says the Office of Defense Mobilization.

Largest certificates to metal-working companies: U.S. Steel Corp., pig iron, $10.9 million (85 per cent allowed), Cleveland; Phoenix Iron & Steel Co., seamless steel tubing, $10.5 million (50 per cent allowed), Phoenixville, Pa.; Jackson Iron & Steel Co., pig iron, $7.5 million (85 per cent allowed), Jackson, O.; Great Lakes Steel Corp., steel products, $5.5 million (65 per cent allowed), Ecorse and Detroit, Mich.; American Can Co., metal cans, $4.4 million (30 per cent allowed), Plymouth, Fla.; Grinnell Corp., pipe, $1.6 million, (50 per cent allowed), Warren, O.



Keyhole View of an Atomic Project

A look through an opening for an air-tight entrance lock reveals construction progress on the steel sphere to house the first atomic plant for submarines. The enormous sphere is being built near Schenectady, N. Y., by scientists of the Knolls Atomic Power Laboratory, operated for the Atomic Energy Commission by General Electric Co. Rising in the middle of the sphere is a 400-foot tower for use in erecting the inch-thick steel walls

ODM Revises Six Expansion Goals

FINISHING touches are being put on six expansion goals by the Office of Defense Mobilization.

New Marks—The goal for by-product coke oven capacity is now 85.8 million net tons annually by Jan. 1, 1955. The original goal provided for yearly capacity of 84 million net tons by the end of this year.

New goal for copper foundry facilities is $5.5 million of capital investment, to be completed by Jan. 1, 1954, an increase of $3.5 million from the goal announced last fall.

Decrease—Facilities to produce brass mill products are slated for $4,150,000 of capital investment by Jan. 1, 1954. This is a drop of $2,150,000 from the previous goal. The goal for ordnance facilities was also cut—from $300 million of capital investment to $170 million, to be undertaken before Dec. 31, 1953.

In materials handling equipment, the goal is raised $4 million to $30 million of investments before Jan. 1, 1954. ODM is trimming $2 million from the initial goal for mining machinery, lowering it to $4 million in new facilities, for completion Jan. 1, 1954.

Machine Tool Makers Expand

Two projects have been approved by the Office of Defense Mobilization to increase the mobilization base capacity for producing certain so-called "elephant" machine tools. The G. A. Gray Co. of Cincinnati and the Onsrud Machine Works, Chicago, will be allowed five-year amortization on new buildings which they will build with their own funds. Equipment will be furnished by the government on a lease basis under so-called stability contracts.

The new Gray plant will be equipped to make large planers while the new Onsrud plant will be equipped for producing large automatic contour milling machines, routers and drills.

Four other "elephant" tool expansions are being studied.

Designs Outrun Manufacturing Techniques

Aircraft engineers warned process research must be speeded up to keep pace with new designs. New thinking required in fabricating techniques

INDUSTRY must devote more time and money to develop its manufacturing techniques if production is to keep up with the huge strides of basic and engineering research, says Roy T. Hurley, chairman and president, Curtiss-Wright Corp.

Opening the Society of Automotive Engineers' Aeronautic Production Forum, combined with the society's national aeronautic meeting and engineering display in New York last week, Mr. Hurley contended that process research hasn't kept up with design: "Most money is going into design, not enough in reducing these designs to production techniques."

Power Goes Up—Good example of the challenge to production men can be found in aircraft power plants. During World War II, reciprocating engines developed a maximum of 2000 horsepower, have climbed to about 3200 today. Jets with afterburners can produce 15,000 pounds thrust—equivalent to 15,000 horsepower at 375 miles per hour, and will go up to 30,000 pounds thrust in coming years, Mr. Hurley believes.

This increase in power potential requires complete new thinking in fabricating techniques, says Mr. Hurley. As speed goes up, so does heat, and present metals won't be able to take it unless higher physical properties are obtained. Another factor is weight. Getting engine weight down to develop more horsepower out of each pound of metal used poses tough problems for researchers and production men.

Panels, attended by more than 900 metalworking men, covered such current engineering problems as how to get designs into production quickly, machining of new metals, production procurement techniques, efficient use of machine tools and tooling, manufacture of compressed buckets and turbine blades, inspection and quality control, manufacturing management, ways and means of handling titanium, forgings and castings and precision forming and joining.

Jetliners Cost More—Discussing the use of jet transport by U. S. airlines, J. W. Barton, Boeing Airplane Co., reported inflation has increased cost of jetliners to $3.5 million to $5 million each, or about $5.35 per empty weight pound, as against $3.50 for a 1949 piston-powered plane.

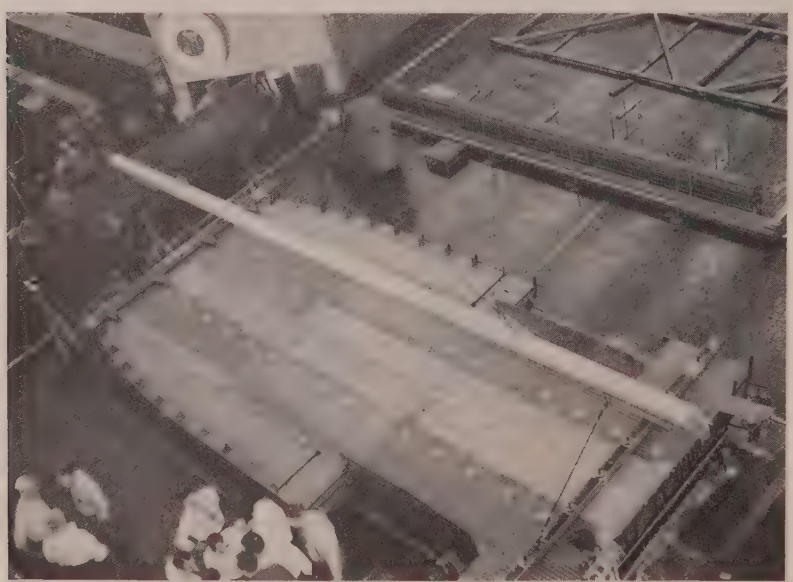
Predicting that planes soon will fly long distances at double the speed of sound, R. R. Bayuk, Wright Air Development Center, says refrigeration would be mandatory. He recommended replacement of hydraulic systems by low pressure pneumatic systems obtaining air from jet engines to actuate landing gear, wing flaps and other parts.

Debate on where to locate jet power plants in a plane brought a recommendation from B. T. Salmon, Consolidated Vultee Aircraft Corp.: Install them in attached nacelles to allow using continuous wing structure housing fuel tanks.

Search for New Materials—New materials must be found for hydraulic system components, stated G. R. Keller, North American Aviation Inc., as present components can't withstand heats over 165 degrees. Best possibility appears to be in mineral and organic materials and fluids.

Bearing problems, long a jinx to jets, are reportedly being licked by new synthetic oils, better bearing tolerances and by blocking off heat from bearing areas.

Mundy I. Peale, president, Republic Aviation Corp., was principal speaker at the society's dinner, Apr. 23. Chairman of the Aeronautic Production Forum was Dr. Michael Field, Metcut Research Associates. Mr. Hurley was sponsor of the forum. W. J. Kunz Jr., Bendix Aviation Corp., received SAE's Wright Brothers Medal for best aeronautic paper for 1952.



Tipping the Scales at Willow Run

First production model of the Chase C-123B aircraft cargo deck gets weighed in at the Kaiser-Frazer Corp. Willow Run plant, Willow Run, Mich., where K-F is also building the C-119F. The huge assault transport floor section is designed to support a pay load of more than 14,000 pounds, contains approximately 35,000 rivets, and tips the scales at 2070 pounds

New J&L Plant in Atlanta

Jones & Laughlin Steel Corp.'s container division will be operating in a new Atlanta plant next fall. Now under construction is a one-story building containing more than 100,000 square feet

New Steel Order Coming

Producers must keep books open for controlled material orders after June 30.

NOW IN final stage of review is the steel order NPA M-1A to supplement DMS 1 (Defense Materials System Reg. 1). Though not effective until after June 30, it is to be issued as quickly as possible so the industry may prepare for compliance.

It will require producers of carbon and alloy steel products and steel castings to reserve space on their books for the acceptance of controlled material orders issued pursuant to allocation directives. It will make provision for lead time and minimum size orders.

It will provide for replacement in inventory of steel products in the hands of steel distributors and restrict deliveries of aircraft quality steel products by such distributors. This order will not apply to nickel-bearing stainless steel, which range of products will continue to be covered by the provisions of NPA M-1 and M-6A.

Nickel: Only Users May Buy

Schedule 1 to NPA M-80 prohibits the purchase of small quantities of nickel under the small user exemption by persons who have no base period history.

The effect is to prohibit buying except for use by the buyer. This prohibition is not applicable to any person whose total requirements of nickel to be used by him in his own plant do not exceed his average monthly purchases or 100 pounds, whichever is less.

Legislative Totals Posted

Up to the Easter recess, Congress had enacted 20 public laws. During the first three months, the House passed 214 measures, including 113 House bills, 2 Senate bills and 99 resolutions. The Senate passed 138 measures, including 50 Senate bills, 14 House bills and 74 resolutions.

In the same three months, the Senate received 9893 executive nominations of which 9350 were confirmed by the beginning of April.

Dock That Climbs Its Own Legs

Another DeLong-type barge which lifts itself by its bootstraps to become a dock undergoes tests at the Orange, Tex., plant of U. S. Steel Corp.'s Consolidated Western Steel Division. Air jacks circling the caissons at deck level climb the caissons, taking the hull with them. Consolidated Western Steel has begun fabrication of six of the barges for the Army. They will be 300 feet long, 90 feet wide, 13 feet deep and weigh approximately 5½ million pounds

CHECKLIST ON CONTROLS

Materials Orders

REFINED COPPER—Amendment of Apr. 10, 1953, of NPA Order M-16 eliminates quantitative restrictions on purchases of refined copper. It was effective Apr. 10.

IRON, STEEL SCRAP—Revocation of NPA Order M-20 on Apr. 15, 1953, eliminates allocations and directives covering iron and steel scrap and ends alloy scrap segregation requirements.

OIL, GAS CONSTRUCTION—Direction 1 to NPA Order M-46B, issued and effective Apr. 16, 1953, permits oil and gas operators to use any lawfully acquired materials in any construction project without first getting authorization from the Petroleum Administration for Defense.

STEEL DISTRIBUTORS—Amendment of Apr. 21, 1953, of Schedule 3 of NPA Order M-6A permits distributors of steel products to deliver nickel-bearing stainless steel to other distributors without requiring authorized controlled materials orders. Such permission applies only to transactions among distributors. Amendment was effective Apr. 21.

Appointments in Washington

Edmund F. Mansure, chairman, E. L. Mansure & Co., Chicago, was appointed as administrator of the General Services Administration to succeed Jess Larson.

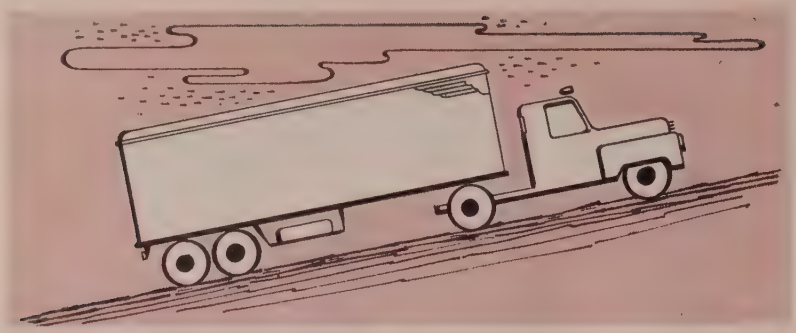
Norman Ross Abrams, vice president, Congoleum-Nairn Inc., Philadelphia, was named assistant postmaster general.

Trevor Gardner, president, Hycon Mfg. Co., Pasadena, Calif., was named special consultant to the Air Force on research and development programs.

Col. Charles H. Bonesteel III was designated as Kansas City, Mo., district engineer.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Shells, 240 mm	U. S. Steel Corp., New York
Shells, 155 mm	Minneapolis-Moline Co., Minneapolis
Shells, 76 mm	Fasco Industries Inc., Rochester, N. Y.
Boosters	Schaible Co., Cincinnati
Fin Assemblies	Rheem Mfg. Co., New York
Synchros	Electrolux Corp., New York
Fuzes, 81 mm	Precision Castings Co., Fayetteville, N. Y.
Small Arms Parts	James Cunningham, Sons & Co., Rochester, N. Y.
	Hawk Tool & Engineering Co., Clarkston, Mich.
Motor Vehicle Parts	General Motors Corp., Detroit
	Stewart-Warner Corp., Chicago
Trucks, Fork-Lift	Clark Equipment Co., Buchanan, Mich.
	Yale & Towne Mfg. Co., New York
Radio Receivers	Federal Mfg. & Engineering Corp., Brooklyn, N. Y.
Transmitters	Radio Receptor Co. Inc., New York
Parts for Pumps & Turbines	Dravo Corp., Pittsburgh
Pumps	Buffalo Pumps Inc., Buffalo
Turbine Governors	Woodward Governor Co., Rockford, Ill.



Trailers on the Upgrade

Percentage of rail-highway ton-miles carried by trailers		Average yearly production of highway trailers	
1936	3.7 per cent	1947-1951	51,900
1940	5.6 per cent	1952	60,000
1950	12.9 per cent	1952-1956	70,000*
1960	27.5 per cent*	1957-1961	130,000*
1970	52.4 per cent*	1961-1970	160,000*

Based on an economic study made for Aluminum Co. of America * Estimated

LONG-RANGE gains are being made in freight trailer production and highway freight volume, according to a study made for Aluminum Co. of America, Pittsburgh. More trailers will roll and their share of freight in the rail-highway total will continue to increase, the report predicts.

The analysis made for Alcoa forecasts that about 70,000 freight-carrying highway trailers will be constructed each year from 1952 to 1956 — assuming conditions of peacetime prosperity. During the years 1957 to 1961, production promises to increase substantially, to approximately 130,000 a year. Further expansion should push annual output to an average 160,000 trailers between 1961 and 1970.

Greater Proportion—The share of trailer freight in the rail-highway total rose from 3.7 per cent in 1936 to 12.9 per cent in 1950, the study reports. Predictions are that the proportion will reach 27.5 per cent of the total in 1960.

This growing use of trailers is explained in the study by time savings in reduced packing and crating, reduced delays and faster over-the-road time. A geographical factor has been rapid industrialization of sections of the country less well served by rail facilities.

Temporary Lull—Production in 1952 ran below 1951, falling short of 60,000, the report continues. Using past trends as a guide, this appears to be a short-term setback. Annual replacement of an estimated 50,000 trailers will provide a bulwark against recession. This replacement rate may be cut by longer trailer life. Increased use of aluminum and stainless steel is raising the average service time of 11.6 years, the report says.

Realizing that long-range expansion is not a certainty, trailer producers are closely watching developments in highway construction and use and programs to combat traffic congestion in cities. Industry men fear that crowded roads could cause the public to legislate trucks off advantageous routes.

Superior Steel Grows

Capacity operation and a $7 million expansion program at Superior Steel Corp. has raised employment at the Pittsburgh firm to the highest level since World War II.

A new clad metal plant, adjacent to Superior's main plant in Carnegie, Pa., will clad carbon steel with stainless steel, copper, brass, nickel and other metals. Production will largely go to the Ordnance department. Limited operations are now under way.

No. 3 STEEL's Management Series . . .

The editors of STEEL herewith present the third in a series of ten articles in its Program for Management. The complete list:

1. Public and Community Relations (Feb. 23, page 53)
2. Industry-Government Relations (Mar. 30, page 53)
3. Research, Basic and Product
4. Purchasing
5. Forecasting Business Trends
6. Distribution—Post-Emergency Challenge
7. Labor and Industry Relations
8. New Materials
9. Depreciation and Re-Equipment
10. Market Research

Recipe for Profit:
Organized Research

10 THINGS RESEARCH CAN DO FOR YOUR COMPANY

1. **Develop new products.**
2. **Discover new materials.**
3. **Improve existing products.**
4. **Adapt products for new markets.**
5. **Simplify manufacturing processes.**
6. **Develop labor-saving machinery.**
7. **Simplify quality control.**
8. **Find substitutes for expensive or critical materials.**
9. **Create values from wastes.**
10. **Evaluate diversification or expansion plans.**

WISE MANAGEMENT will see to it that those who direct its research organization are a part of its policymaking group. You can be sure that your company's research program reflects the strength and weakness of the management of which it is a part.

Men planning the course of today's metalworking industry need facts—dimensional facts from the laboratory and interpretative facts on markets. Research, whether basic or product-type, supplies these facts for the management equation. The formulation of the equation and its ultimate solution, however, rests with management itself.

NOT EASY—Planning a technical research program is one of the most difficult of all management responsibilities. Here there is need for intimate understanding, not only of the company's products and processes, but also of all technologies that might affect them. In addition, recognition must be taken of the technological and economic changes affecting both raw materials and the finished products. Not to be overlooked in the picture are the technical developments influencing competition.

Research became a significant economic factor in business when it became organized. It had little chance for growth as long as it was based upon inspiration alone. When today's integrated laboratory came into being, research became as systematic as a planned sales or production campaign. It is highly organized, carefully planned, and expertly executed. Because of this, it is efficient—and with this efficiency has come the phenomenal growth of research in the past ten years.

WORTH THE TROUBLE—Most metalworking men agree to this: Without a continuing stream of new products, the present pace of U. S. manufacturing would slow down to a plodding walk. Yet, at one time or another many business men have asked themselves: Are new products really worth the trouble?

How does a company pay for new product development? Where does the research money come from? Generally there are two alternatives: 1. Add an across-the-board premium to the price of all its products, or 2. put a high price on each new product as soon as it is ready for the sales department.

Neither road is the final answer. If a premium is added to all products then there is the risk of pricing some of them out of the market. A high price tag on a new product may delay its acceptance. This will cut down on the running start you need over competition, production-wise.

THIS IS IT—Best that can be done is generally a compromise with the second alternative. You price the new product as high as you feel the market will stand. Then push toward a high sales volume as fast as you can. When competitors show up, and they always will, you start cutting prices until the product is no longer profitable. By that time you will have paid for the research and made some profit, according to today's odds.

There is this really bright spot: Your new product may gain firm enough acceptance to stay ahead of competition for decades. That's when you really hit the jackpot.

BATTING AVERAGE — What are the chances of a research project paying off? Obviously, a company does not hit the jackpot everytime it pulls the lever. But when it does, the success overshadows all previous disappointments. In many cases the chances of a research project paying off depend on what is meant by paying off. Sometimes it's valuable to know that something cannot be done, or at least that it is difficult. There are inherent guideposts for management planning in negative results.

But positive results are what swell the balance sheet. Take the example of Minnesota Mining & Mfg. Co., where research has proved to be such a valuable ally. It has enabled the company to expand its product line from sandpaper to more the 1000 diversified items in the last 50 years. Although research has been costly, reaching close to $35 million, the results have been favorable. Some $25 in sales has been realized for every dollar invested for research. Products marketed as a result of this research accounted for almost 90 per cent of the $190 million sales volume last year.

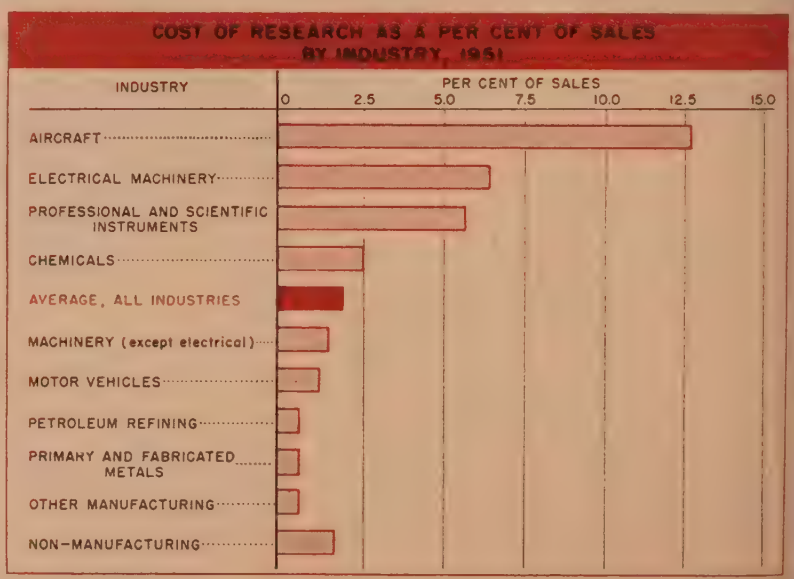
HERE'S HELP—The relatively new science of engineering-economics is helping management cut down the number of misses in research. Through it one can decide in advance whether the technical goal is a worthy one economically and by operations research studies it is possible to determine whether the proposed program is the one best calculated to promote the company's objective.

The term "operations diagnosis" has been coined to describe the analytical approach to evaluating research opportunities and research planning. This concept implies the abandonment of whims or hunches regarding where research should be applied and how it should be directed, and promotes development along lines established by scientific analysis. Frequently, a pending development in a field of technology far removed from the interests of the company will have a more profound effect on the future of the company than anything it may be working on.

BIG MONEY—Over $3½ billion went into research and development of new products last year—four times the expenditure at the beginning of World War II. Two-thirds of this sum was spent by private industry. Almost half of industries' research, however, was financed by the federal government, largely by the Department of Defense and the Atomic Energy Commission.

Cost of research during 1951 amounted to around 2 per cent of the total value of sales and services based on data collected from almost 2000 companies surveyed by the Defense department's Research & Development Board. These companies employed about 94,000 research engineers and scientists in January 1952. Average ratio of supporting personnel to technical was 3 to 2.

HOW MUCH?—In the planning and budgeting of research programs, administrators often rely in part on rule-of-thumb relationships. One relationship frequently utilized is the ratio of research cost to value of sales. Based on this criterion the RDB survey showed that the percentages spent varied widely among industries (see chart). By far the highest fig-



BALANCED RESEARCH—A good principle of research management is to maintain a balanced portfolio of projects: Some of the long term type and short jobs aimed at immediate product improvement and new uses

ure, 13 per cent, was spent by aircraft manufacturing. The next highest, 6 per cent, was found in the electrical machinery and the professional and scientific instruments industries. Nonelectrical machinery spent about 1.5 per cent, and motor vehicles spent slightly less.

At the low end of the scale were primary and fabricated metals and other manufacturing industries, where research costs amounted to only 0.6 per cent of gross sales. However, total values of sales in these industries is so great that even this low percentage represents a large dollar volume of research.

The survey showed that the average cost per research scientist or engineer was $22,700 in 1951. Highest costs was in the motor vehicle industry at $68,600 per man. Small companies with fewer than five research scientists averaged only $15,400 per professional man, compared with $25,000 for those having 1000 or more scientists and engineers.

Where To Look

Job of research management is to get problems solved. There is no such thing as an automatic means that will guarantee results. The research director cannot buy a computer or lease a machine that will turn out answers to technical difficulties, design tests for new products and iron out the bugs in a new process.

Buildings and laboratory equipment are external manifestations of a research organization. They make the going easier, but in the last analysis the research administrator must depend upon the human mind to produce the results which his company needs and wants.

NO SPECS—What does industry look for in a researcher? Certainly the requirements are not to be found in formal written specifications. They will vary for different units of industry and for different outlooks towards research.

Creation of new understandings, new principles, new products, and new services is research: Then creativeness on the part of research workers is the first basic requirement. Members of research staffs are not equally creative. It's a good thing because a staff of all highly creative members would be next to unmanageable.

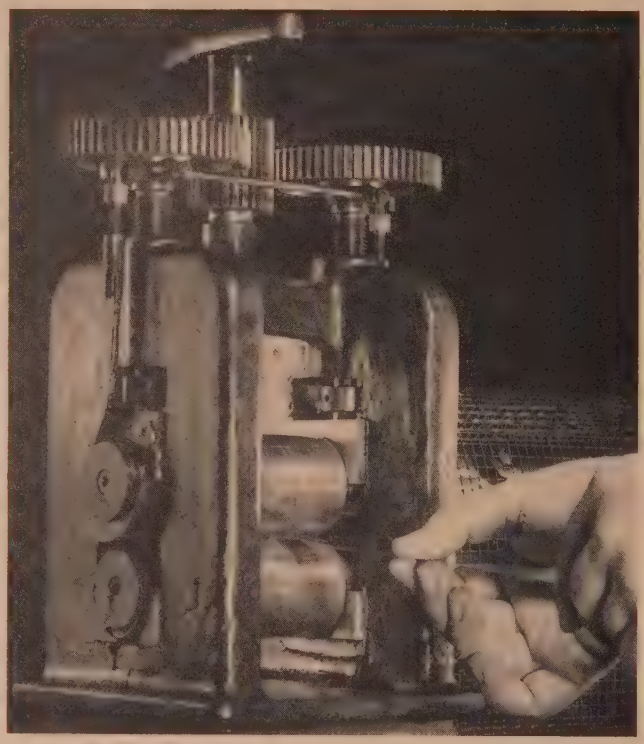
GAGE THIS—Creativeness is difficult if not impossible to gage during pre-employment interviews. There are no sure guideposts. Creativeness of an applicant is something about which one learns by observation in a research environment. The research administrator needs to know the amount of creativeness among his men. The research man should know the degree to which he can be creative.

In any case, creative ability must be backed with fundamental knowledge and training. While not proved, industries seem to feel it is more effective to draw research workers from many educational institutions rather than to take many graduates from a few institutions. Research organizations having a record of fruitful results have developed an understanding of research and of the research staff. They are tolerant of new staff members during the starting period.

SHOW DOLLAR VALUES—To do his job, the research administrator should make it possible for the individual in his organization to become more receptive to new information and more flexible in his thinking by presenting company problems in a broad context. Above all he should indicate potential value of results to company progress. Interest in his job is a key factor in the success of what the research worker is doing. An understanding of what his work means to his company can go a long way in stimulating interest.

Relating to the standpoint of interest, the important management factors arise with the leaders closest to the working level. These are usually group or project leaders. It is the leader's responsibility to keep the attention of the team as a whole focussed upon the ultimate results desired. His responsibility to management is to make sure that individual findings and attitudes are combined into an overall result. Frequently, he should establish and re-establish the major objectives of the research.

ONE BIG PUSH—Industrial research today, has come more and more to depend upon teamwork. The ability of an individual to work as a member of a creative group assumes great importance.



SPECIAL EQUIPMENT—Miniature rolling mill at Battelle Institute is an example of equipment available in contract research

Reason for emphasis on team research: The team can solve problems where an individual may not be able to do so.

Researchers must thus be chosen not only for their individual creative ability but also for their aptness to co-operate in the group problem-solving process. A research organization can tolerate a few self-centered, temperamental, lone-wolf workers, but if real progress is to be made nearly all of its members must be co-operative and filled with the spirit of teamwork.

WATCH THIS—Here's an encouraging note. Management attitudes are generally far more important in encouraging teamwork than the personalities of the researchers. Given the right spirit, the great majority of research workers will join in productive team activity. Management should keep this in mind: Team research does its best when there is freedom from petty annoyances, open channels of communication, fair personnel policies and frank explanation of problems.

Get Off to the Right Start

One of management's major research responsibilities is to make investment decisions at the planning stage of a research program. Success or failure of a company's research program hinges largely upon the judgment of its executives on just where the research dollar should be spent.

BEAR IN MIND: Good research management requires that projects be in the best interest of the company and that overall research objectives are clearly understood. In the choice of laboratory problems the research director must take a positive stand with other company executives. But first management must set forth a clear understanding of the policy of the organization with respect to the industrial fields in which it is willing to operate and whether it wishes to confine itself solely to its present manufacturing activities or is willing to extend in new directions.

STEEL'S OBJECTIVES—U. S. Steel Corp. views its research objectives as including: 1. Improvement in quality of current products; 2. development of new products and processes; 3. co-operative study of customers' and suppliers' products; 4. development of means for increasing efficiency and decreasing cost of operations; 5. application of fundamental scientific principles to the control of steelmaking and processing operations; 6. advising management on the significance of new technological developments.

Where do the ideas come from? They may come from any source within or outside the organization, but mainly from research, sales and operating divisions. There are always more than can be followed up. When an idea comes to the front, certain general steps are taken: Most important is to obtain a clear statement of the problem. Since U. S. Steel has different types of research facilities at several locations, the next step is to get the experimental work under way where the problem may best be attacked. If there is doubt, Dr. E. C. Bain, vice-president, research and technology, after consultation with his associates, allocates the problem to the laboratory where facilities and experience are best suited to handle it.

In general, the research laboratory at Kearney, N. J., concerns itself chiefly with fundamental, long range problems of steelmaking. The laboratory at Pittsburgh deals more with work closely related to actual operating and customer problems. Much of the applied research is carried out right in the various plants through ar-

rangements with the plant laboratory.

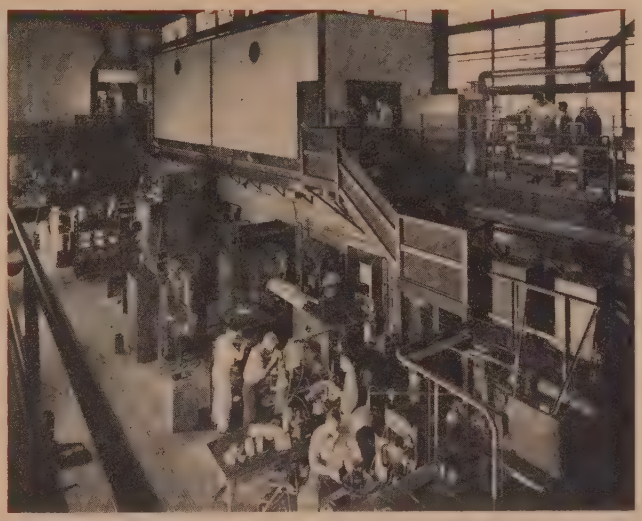
FREEDOM — Local laboratory management, upon being assigned the problem, holds a short "free for all" planning meeting. Then the supervisor and his group leader prepare a program. Here the objective is elaborated on and some idea is given of the approach. However, no attempt is made to freeze the details of the program. Laboratory management relies heavily on resourcefulness of the men actually doing the work.

Once the problem is assigned, teamwork takes over. Reason: Most problems require a variety of technical skills for their solution. An effort is made to see that everyone working on the problem feels he is a member of the team.

MACHINE TOOLS TOO — Research in a machine tool company is necessarily conducted by a smaller staff but interests are broad. Cincinnati Milling Machine Co.'s research activities initially were concerned with problems in mechanical engineering—bearings, transmissions and feed mechanisms —and in hydraulics.

Out of the early research in bearing systems came the Filmatic bearing, standard on the company's machines for 15 years. Research in hydraulics resulted in thousands of tracer or servo-controlled milling machines for various contour machining operations.

MAKING CHIPS—Metal cutting studies under Hans Ernst, director of research, have been concentrated since their beginning on the process of chip formation and all the allied phenomena in metal cutting and grinding operations rather than making a series of empirical cutting tests with various combinations of cutting angles and materials. These studies led to a third link in the chain—from mechanical engineering to physics to chemistry — and broadened the field of study still further. Test data showed that cutting fluids act to reduce chip friction not by a physical process but by a chemical reaction with the new-born or nascent chip surface. As a result of this information the company developed and is marketing a cutting fluid.



The metals building at Armour Research Foundation houses heavy industrial sized equipment for many types of metallurgical investigations ranging up to actual production line problems

When Is Contract Research Helpful?

1. **When you do not have a laboratory of your own.**
2. **When the problem is too complex for your facilities or staff.**
3. **When the problem is outside the interests of your staff.**
4. **When you wish to expand your research on a temporary basis.**
5. **When you wish outside viewpoints.**
6. **When you want to get the research going while you enlarge or create your own laboratory.**
7. **When a multiplicity of talent is required.**
8. **When technical manpower problems thwart your efforts.**
9. **When the research can be conducted at less cost to your company.**
10. **When you do not have the capital to invest in specialized scientific equipment.**

ATOMIC MACHINING — In the last two years the laboratory developed a technique for rapidly determining tool wear rate under various conditions. Carbide and high speed steel tips are ground and lapped to shape and size and sent to Oak Ridge for irradiation. Upon their return they are clamped in a special clamp-type holder and used to machine a prepared specimen of work material. Each chip passing over the tool face carries off a minute amount of irradiated tool material and thus itself becomes radioactive. The higher the rate of wear the higher the activity of each chip. In ten seconds of cutting, enough chips are accumulated to make a determination of comparative tool wear rate.

EXCHANGE IDEAS—Forward looking companies encourage their research staff to attend scientific meetings. Presentation of papers on research results is an asset to whole organization

Farm Out Research

Of the 17,000 larger manufacturing concerns in the U. S.—those having gross sales of $500,000 annually—only 2500, or about 15 per cent have research laboratories. Specialized research facilities and an experienced and diversified technical staff require large budgets. Even the largest companies find it difficult to maintain laboratories where they can obtain solutions to a wide variety of problems. Some agency is needed to fill the almost inevitable gaps in company research facilities.

OUTSIDE FACILITIES—In recent years and particularly since World War II, the practice of farming out research has become widespread. Industrial firms now contract with outside laboratories to handle their research problems in the same way they contract with suppliers for the specialized parts used in their products.

There are four types of research organizations that come under the classification of outside laboratories: Commercial laboratories and consulting firms; industrial laboratories; universities and their research affiliates; and research institutes and foundations. All have the common purpose of supplying, to the firm that engages their services, information that will promote that firm's technical progress.

EXPERTS — Consulting firms and commercial laboratories now do contract research. The consulting firm may be a one-man operation, or it may consist of a group of men who advise and conduct investigations within the fields of their specialization. One of the earliest commercial laboratories is Arthur D. Little Inc., Boston, which began operation in 1886. Other well-known consulting laboratories: Foster D. Snell Inc., Miner Laboratories, Evans Research & Development Corp., National Research Corp., Frederick S. Bacon, Dorr Co., Comstock & Wescott Inc., Gustavus J. Esselen, Sam Tour & Co., Graham, Crowley & Associates.

The services of the individual consultant or firm of consultants may usually be engaged on a fee basis. The larger laboratories often charge on a man-hour basis, although fixed sum contracts are sometimes used when the effort to be expended can be clearly outlined.

RESEARCH SERVICE — The second type of research organization available to a company that wishes to have its research done outside its own plant is that provided by industrial laboratories in other plants. For a long time it has been customary for large companies to give their customers help with their technical problems. Sometimes this help is provided free in the hope that it will lead to a new or expanded market for the company providing the technical aid. Some companies with large laboratories of their own also assist their suppliers with technical and production problems.

Interchange of technical aid among companies working on defense contracts during the war led to a recognition of the fact that research services of a company laboratory can be sold as well as the company's products. Result: Some large industrial laboratories now actively seek contract research. For example, Bendix Aviation Corp. advertises the availability of its expert assistance to companies in product development.

HELP HERE—Universities and colleges, their engineering divisions and their research foundations, are the third type of outside research assistance. They handle the bulk of the contract research placed by industry, which last year amounted to 10 per cent of the total research conducted in this country.

A company wishing to engage the services of a university laboratory will find a variety of arrangements possible. Fellowships are still used. However, the great volume of research now conducted by universities is contracted through their formalized research organizations. This runs into sizable sums of money. For instance, in 1951 the Engineering Research Institute of the University of Michigan conducted more than $3 million worth of sponsored research for

PROGRESS REPORTS—Management may be advised of research progress by weekly, monthly, or special reports. Reports help sales groups who have responsibility for new developments

industry and government. Sponsored research in the Research Division of the New York University College of Engineering last year totaled close to $2 million.

TYPICAL—The Purdue Research Foundation is a typical university research foundation. It seeks and negotiates contracts and provides overhead control, financial arrangements and patent assistance in connection with research contracts. All the research it administers is performed by faculty members and graduate studuents in regular university facilities. Some 60 organizations now have features in common with the Purdue Research Foundation.

The independent research institutes, which are the fourth type of outside research organization, conduct an appreciable share of the country's business. Present day figure is somewhat over the $50 million a year mark. The four largest—Battelle, Armour, Stanford and Mellon—alone did about $30 million worth of business last year.

The work of research institutes is predominately applied research, with immediate industrial objectives. Let's take a look at the operations of Battelle Memorial Institute, which is typical.

TALK IT OVER—A company with a research problem discusses it with Battelle officials and with various members of the institute's technical staff. The problem and objectives are clearly defined. If the institute does not have prior commitments in the field of interest, and if the problem seems amenable to research, a program is outlined and submitted to the prospective sponsor. Once the program has been agreed to by both parties, the cost and time involved in conducting the research can be estimated fairly closely. These are made a part of the contract so that the sponsor knows his cost in advance.

The cost depends upon the scope and duration of the project. It consists of charges for the services of research and supervisory personnel and their assistants. A research study may involve the expenditure of from $5000 to several hundred thousand dollars.

MANY HELP—At Battelle, a research project is regarded as the responsibility of the institute as a whole. It is assigned to the groups best qualified to handle it. Any of the 2000 persons on the staff may be called upon to contribute their specialized talents. The company sponsoring the work get just about the same benefits and services as if it owned the $15 million laboratory.

During the course of the research investigation there is constant liaison with the sponsoring company. Arrangements are made in advance for the type of research reports needed. These may be in the form of monthly letter reports, topical reports or quarterly reports.

Any degree of confidence that the sponsor may wish can be maintained. If the work leads to patentable information, Battelle will, at the request of the sponsor, apply for patent protection and assign them to the sponsor.

MORE LARGE THAN SMALL—Although contract research is used by many small businesses, large companies with laboratories of their own make even greater use of outside research than do small companies. In the case of large and medium-size companies, contract research supplements the work of their laboratory. It makes unnecessary the maintenance of facilities or staff for which there will be only limited use.

It also provides a mechanism for introducing fresh ideas to company research. Many large companies deliberately go outside their own laboratories in search of fresh thinking. The independent laboratories, with their knowledge of what is going on in many fields of science, can often steer their sponsors into new opportunities. Contract research is especially useful when a company wishes to expand temporarily its research activities beyond its permanent laboratory capacity.

Contract research is less risky economically to a small company than an attempt by the company to do its own research. Why? No capital expenditures for equipment are risked.

ALL KINDS—Let's look at a few of the projects at Armour Research Foundation last year, where over $8 million was spent on 397 sponsored projects. Work on processes for recovery of manganese from open-hearth slag and low grade ore was sponsored by the American Iron & Steel Institute. Work directed toward a more economical process for making ductile titanium was carried out for an industrial sponsor.

Westinghouse Air Brake Co. sponsored work on the application of the shell mold process to production of ductile iron, aluminum, and brass castings. Another com-

pany initiated work on coatings for permanent molds for cast iron pipe. Under a technical assistance program the foundation workers improved instrumentation of a continuous casting machine for Nichols Wire & Aluminum Co.

ACROSS THE BOARD—American Foundrymen's Society published the results of a program it sponsored on hot tears in steel castings. Steel Founders' Society of America sponsored a study of whirl gates. Heat treating procedures for surface hardening of long slender parts with unusually close tolerance requirments were developed for the Teletype Corp. Another company sponsored a project to improve the cutting performance and wear life of its power hacksaw blades.

Lincoln Electric Co. is sponsoring a long range research program, now in its fourth year at Armour, the objective of which is to achieve a better understanding of the nature of arc welding and to improve welding performance and weldments. Other work involved a study of resistance-butt welded tubing for the Clayton Mark Co. Important welding aspects of valve manufacture were investigated for a subsidiary of Rockwell Mfg. Co. Inland Steel Co. is sponsoring a project initiated 11 years ago on the corrosion of tin plate. Shelly Steel Corp. sponsored a survey to find a satisfactory way to produce various colors on hot dipped galvanized steel sheet.

HOW MUCH MONEY—There is no rule of thumb by which one can estimate the cost of a contract research project. The nature of the problem and difficulties involved enter in. A minimum program in a university laboratory may cost from $10,000 to $20,000. At Battelle, they recommend that small businesses think in terms of spending $10,000 to $15,000 a year, carried on for several successive years.

A study of contracts placed with Battelle during January of this year showed that 21 contracts for projects of approximately one year's duration were signed that month. These ranged from $2000 to $60,000 each, with the median at $12,000. Five contracts specified sums of $5000 or less and seven contracts were for $20,000 or more. Some short-term contracts were for as low as $1000 and others were at annual rates in excess of $50,000.

Using Research Results

Research communications may take many forms. Management may be advised of progress by weekly, monthly or special progress reports. Special project reports should be prepared for top management when any project has been brought to the stage requiring consideration of an experimental plant or when it has reached commercial status.

Weekly or monthly reports from the research laboratory help sales groups who have the responsibility for new developments. Close co-operation between sales and research is required for rapid development of a scientifically based new product. It is a management responsibility to see that the communication of original research results from one department to another in a company is efficiently and clearly accomplished.

DON'T PASS UP THESE—Outside the company there are many ways whereby communciation of research results can serve broad purposes. One of the most valuable is supplying customers with information which will enable them to use more efficiently products you have already sold. Don't forget, too, that the publication of basic research results can give many intangible values. Numerous avenues open up here.

Company research will not long survive unless it gives established markets for new or improved products. Therefore, communication methods should have as their first object that of sales development. Preparing suitable technical bulletins is a logical initial step in such a program. In communication of research findings beyond the limits of the company there are many paths open: Technical and trade journals, trade associations, technical societies, company literature and catalogs are some of the more obvious.

WEIGH POSSIBILITIES — It's just plain common sense that a company's management should not spend its stockholders' money on research merely to make its results equally available to all competitors. This means that publication of results may be delayed until patent coverage is obtained. In many cases however, it is possible to disclose basic scientific advances without serious delay and without interfering with commercial advantages. Forward-looking companies realize that they can attract better men to their laboratories if they are reasonable and permit publication at the earliest time compatible with the economic advantage.

Research staffs should be encouraged to attend technical society meetings. A well-integrated program will also include provisions to present papers at such meetings. Not only will this bring your data to the attention of a large number of technical men but it will also allow the research workers to improve their scientific reputation. It also paves the way to subsequent publication of the paper in a journal.

GOES DEEP—On the whole, encouraging publication of research results raises the scientific tone of a laboratory. It is a great asset to the whole organization. Today more than ever before, the reputation of a company in financial circles depends to a degree on informing the public of its scientific achievements. Those who forecast financial prospects are keenly aware of research and its effect on the company's progress.

No company can afford to overlook the importance of good standing in government circles, particularly during times such as these when military activity proceeds at an accelerated pace. Establishing a scientific reputation adds value in holding the confidence of government.

INVITE THEM IN—In communities where your research laboratory is located, there is always a ready audience waiting to look at what you are doing. Many companies capitalize on the open-house idea. Research open house may be held on an annual basis or whenever an important event in the company justifies it. Results from a well planned program have many desirable results that can't be bought any other way.

Power Tools for Home Use Gain Sales

Increasing "do - it - your - self" trend keeps manufacturers happy and busy

Shopmaster

"JOHN, I need another shelf in the utility room. Get out your tools this week end and put one up."

That may sound a sour note to many husbands but it's music to the ears of small power tool manufacturers. The trend toward "do it yourself" at home has created a new industry in the past decade.

Strictly Amateurs — Prior to World War II, most power tools were used in industry. Since then, more and more of the production of such firms as Black & Decker Mfg. Co., Towson, Md., Skil Corp., Chicago, Porter-Cable Machine Co., Syracuse, N. Y., and others is going into the home for use by the amateur. However, not until about 1948-49 did home use of these devices realize its greatest growth.

D. J. Ridings, president of Porter-Cable, estimates that the total volume of business for all portable power tools is about $300 million at the manufacturers' level, or $500 million retail. He believes about 25 per cent of that, or $125 million retail, is spent by homecraftsmen. Other manufacturers agree with him.

Case Study—In the case of Porter-Cable iteself, in 1948 homecraft tools accounted for about 15 per cent of total production, the rest going to industrial applications. In 1949, the percentage rose to 20; in 1950 to 25; in 1951 to 38 and in 1952 to 47 per cent.

Black & Decker, one of the largest manufacturers of portable tools, reports that, basing its figures on 1950 as 100, the sales index of its Utility tools will rise to an estimated 173 for 1953. Skil Corp., which has been making a popular-priced consumer line only a little over four years, reports that in 1952, the line accounted for 45 per cent of total sales.

Two in One—The industry itself is divided into two more or less distinct segments. The older consists of portable electric power tool manufacturers. Black & Decker claims to make nearly 150 different portable tools.

Then there is the stationary tool segment, which includes the all-in-one-type mounted tool. Typical is Shopsmith, made by Magna Engineering Corp., Menlo Park, Calif. It includes an 8-inch saw, 12-inch dic sander, 15-inch vertical drill press, horizontal drill and a 33-inch lathe.

Space and Dollar Conscious—A need for economy has fostered the all-in-one tool. Not only does the buyer think he is getting all he needs in one package for one price, but in many cases he has a tool which fits into one end of the utility room. Some makers of portable tools market tables and interchangeable parts which make their products nearly as versatile.

Tools run anywhere from about $20 for a portable job up to well over $200 for all-purpose rigs, without the motor. Why will the consumer pay that money just to make more work for himself? As G. Ross French, assistant advertising manager of Black & Decker, puts it, "The $75-a-week clerk cannot afford the $150-a-week professional."

Just for Fun—In addition, most people today have more leisure time to develop their "fix-it" talents. It's a hobby with many men —and women. It is also a therapeutic form of relaxation. Furthermore, more persons own their own homes now than ten years ago.

About 15 companies supply the bulk of this growing market. But there is plenty of business for all —more than they can handle under present production, in fact.

Same Old Reason—Controls were instrumental in building a considerable backlog. Manufacturers had trouble getting the steel, copper, aluminum and machine tools they needed, but the situation is already eased or will taper off soon.

Most companies are planning an expansion of facilities or labor forces to meet the demand. One company even sold a portion of its industrial equipment line to make room for the homecraft-type tool.

Not Dry Yet — Manufacturers consider the industry to be in its infancy and that demand will continue to mount. At a recent exposition of do - it - yourself gadgets in New York, power tools were the most popular exhibits.

Blessed Assurance—With the increase of home ownership—over 23.3 million homes owned by occupants in 1950 as compared with only about 15.2 million in 1940—sales of small power tools should ride high for some time to come.

Windows of Washington

STEEL TO ACQUIRE "BIRTHMARKS"
. . . standard markings would cut confusion

Air Force pushes for standard marking system for alloy steels to eliminate confusion in warehouses and consumers' plants. Producers would imprint identifications

A STANDARD marking system for alloy steels which would identify the material from the producer's mill through all channels to final consumption is being pushed by the Air Force.

The campaign is prompted by the confusion that sometimes arises in warehouses and consuming factories due to the various color coding, die stamping, tagging or stenciling methods used.

Sold for Scrap—Air Force officials point out that immediately after World War II thousands of tons of alloy steel were sold for scrap because original markings had become meaningless. The only alternative would have been to resort to costly chemical and physical analyses of each piece.

Purdue University bought a quantity of steel as surplus for $1 a ton. Presumably the material was carbon bars. When university metallurgists made tests they found they had purchased a quantity of tool steel that originally cost $1.50 to $2 a pound.

Birthmarking — The Air Force would like to have all alloy steels birthmarked at the producers' mills by a uniform system. The marking would include: 1. Producer's name or symbol; 2. specification of the material; 3. condition of the material.

The suggested means of marking is continuous ink printing. At least three companies now are making machines which imprint identification automatically, or semiautomatically. System is low-cost and minimizes the chance for human error.

A standard system would eliminate the necessity for remarking the steel by warehouses, fabricators or manufacturers. It would be a special boon to the subcontractors who may be doing work for several prime contractors and who may lack an adequate system for keeping track of the special alloys they are required to use.

And obviously, such a birthmarking system would lessen the headaches for the Air Force. It would permit easier transfer of materials from one contractor's plant to another in event of emergency.

Job for Producers—Several producers are studying the Air Force proposal.

Large users of alloy steels, particularly the aircraft companies, have much to gain from the system. Douglas Aircraft Co. Inc., Santa Monica, Calif., says it costs $9 a ton to degrease, clean and reidentify incoming steel stock by color code. North American Aviation Inc., Los Angeles, figures remarking steel cost $6.80 a ton for banding alone.

Federal House Cleaning . . .

Herbert Hoover believes the Eisenhower administration is making remarkable progress in the reorganization of the federal government.

"I have been in constant contact with the administration on this problem," Mr. Hoover told STEEL. "Mr. Eisenhower and his aides are attacking the problem with great vigor."

Mr. Hoover applauds the administration's moves to bring government back home.

"I am a great believer in state and local government. The closer government is to its source the more efficient it is likely to be. A great many functions which have been taken over by the national government during the past 20 years could be handled more efficiently if returned to the state and local level."

Three reorganization plans now are in effect or are in process of being made effective. One creates the Department of Health, Education & Welfare, now effective. Another simplifies operation of the Department of Agriculture and brings its programs close to state and local levels and adapts administration to regional, state and local conditions. This will become effective June 2, unless rejected by two-thirds majority of House or Senate.

The third plan establishes in the Executive Office of the President as a new agency the Office of Defense Mobilization and consolidates the functions of the chairman of the National Security Resources Board, and all functions under the strategic and critical materials stockpiling act, including those of the Munitions Board.

acetylene

propane

natural gas

nufactured gas

hat have you?

you choose the fuel!

FOR MOST ECONOMICAL FLAMATIC SURFACE HARDENING

Now you can get the **hardness** you want, **where** you want it, on either high production quantities or small lots of different parts, and use the fuel you choose for maximum overall economy. Flamatic performance in selective hardening of gears, cams, camshafts, crankshafts, cutters, snips, etc. comes from fast heat input with high temperature flames to specified areas of the part — plus electronic temperature control for uniformity of results. Recently, Flamatic developed a compressor unit to bring a wide range of fuel gases, (supplied at low line pressures), up to pressures which provide performance comparable with acetylene and propane. The Cincinnati Flamatic Heat Engineering Laboratory—now in a large new building—is better-than-ever staffed and equipped to analyze your surface hardening needs, experimentally Flamatic harden, and make practical recommendations.

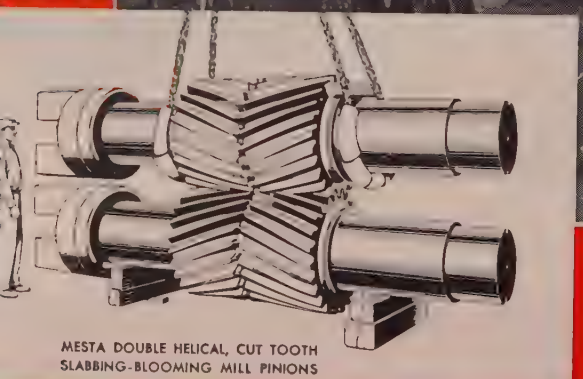
flamatic

THE CINCINNATI MILLING MACHINE CO.

Cincinnati 9, Ohio, U.S.A. • CINCINNATI

MESTA

MODERN REVERSING SLABBING-BLOOMING MILLS



MESTA DOUBLE HELICAL, CUT TOOTH SLABBING-BLOOMING MILL PINIONS

MESTA 46" TWO-HIGH REVERSING SLABBING-BLOOMING MILL

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Flood the U.S. with Foreign Goods?

The president of ASME thinks it might happen if we opened our tariff doors completely. He points to a couple things we could import without any danger, though

THE GREAT challenge of our day is that of finding the means whereby the free flow of international trade in all directions can be reestablished, Frederick S. Blackall Jr., president of the American Society of Mechanical Engineers, told the First Annual Engineering Management Conference in Detroit.

"Undoubtedly some application of the medication proposed by Henry Ford II (abolish all tariffs, abolish all immigration quotas, banish the "Buy American" program and simplify customs restrictions, STEEL, Feb. 23, p.61) would be salutary, but in more limited and carefully directed doses than he seems to envision. Ten grains of aspirin may cure a headache, but the whole bottle may kill you."

Neglected — On two points, at least, Mr. Blackall believes the U.S. can well afford to import ideas from Europe, however. For one: "American industry should emulate Europe's example in the thorough and widespread training of apprentices. Too many U.S. industrialists are neglecting apprentice training, to which the acute shortage of skilled help is traceable in part."

Also, "it is shocking that the U.S., as the world's leading industrial nation, possesses no facilities for industrial exhibits comparable to those of Hannover, Germany, or even at Olympia in London. The European machine tool exhibition, held at Hannover last autumn, occupied some 700,000 square feet of floor space in the world's finest industrial exhibition ground and was a monument to Germany's amazing recovery."

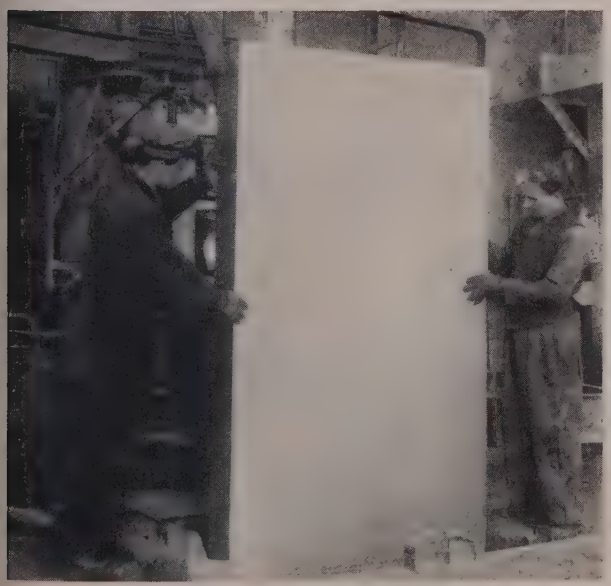
Cautious—It is that astounding recovery of leading European industrial nations which dictates a cautious approach to opening the American market, says Mr. Blackall. "Our standard of living has been built upon a century and a half of tariff protection and a 20-year program of increasing the cost of labor. Thus our labor costs average about three times those of Western Europe and from five to eight times those in much of the world.

"The thing which has enabled our productive industries to produce competitively and at low cost with high-priced labor is their tremendous volume of output. It is the great mass market of the U.S., with a spending power not equalled elsewhere in the world, which made that volume possible. Will this long endure if we open our gates to unlimited immigration and the demoralization of our markets with the products of workers who are paid one-third or less of what ours are receiving?"

Schuman Plan Steel Prices

Steel prices for the Schuman plan countries which have been sanctioned by the Montaunion are: Steel bars, $82 per ton, f.o.b., to dollar markets, $88 to Argentina, $86 to other countries; structural steel, $90 to all countries; heavy and medium plates and universal steel, $110 to the U.S. and Canada, $115 to other dollar countries, $120 to all other countries; wire rods $80 to all countries; hot strip and skelp, $95 to Canada, $100 to the U.S. and all other countries.

The prices have been agreed on by France, Luxembourg and Belgium. They have been recognized by Germany.



Big Ingots from the World's Largest Aluminum Producer

Tongs lift a 1000-pound aluminum ingot from its mold (left) at Aluminum Co. of Canada's Arvida, Que., works. This plant is by far the largest aluminum producer in the world with a 353,000 ton annual capacity. A 1000-pound ingot is stacked (right) prior to shipment from Arvida. All shipments of Canadian aluminum last year reached 499,950 tons, with 257,730 tons going to the U.K. and 114,510 tons to the U. S. Magnesium is also produced at Arvida

Specify

N·A·X
HIGH-TENSILE STEEL

BUMPER FACE-BAR

for

High Strength and Impact Resistance with Excellent Cold-Formability

N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

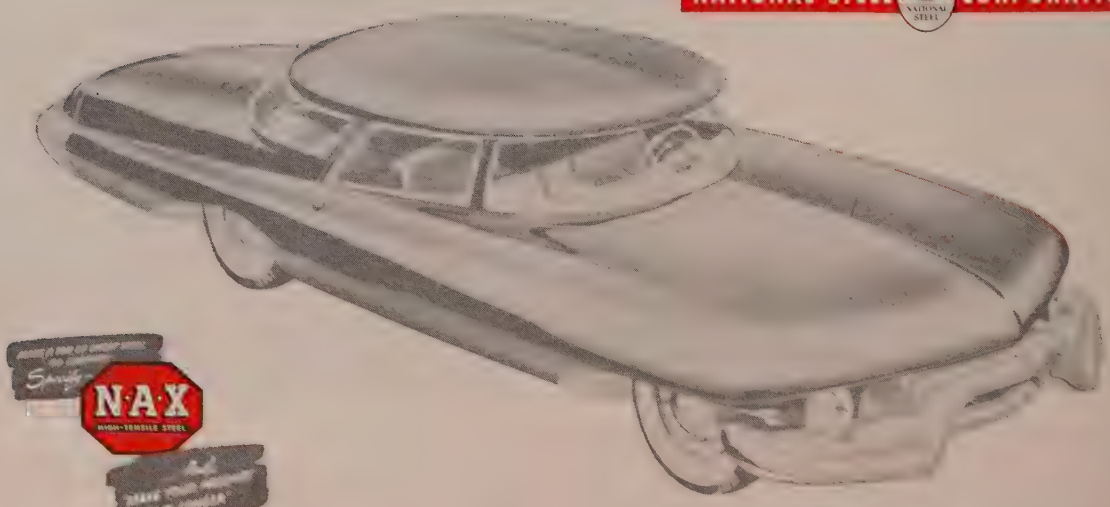
N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made lighter in weight . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Mich.

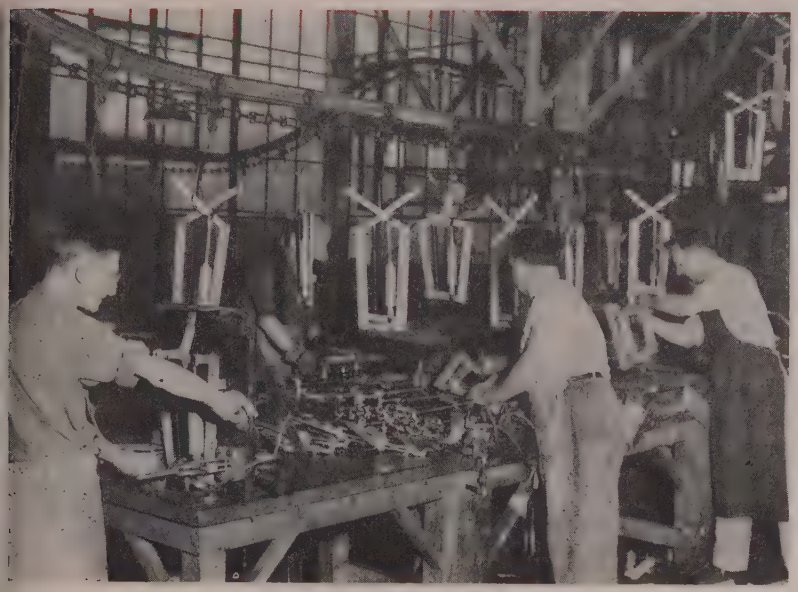
NATIONAL STEEL CORPORATION



KEEP YOUR SCRAP MOVING TO YOUR DEALER

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom



Push-button window regulators are assembled and tested at Dura Division of Detroit Harvester Co., Toledo. Dura supplies General Motors, Packard and Hudson

Power devices on way to becoming standard equipment on even lower-priced cars. More than 1.5 million equipped with push-button devices since end of World War II

DETROIT

AS THE crank vanished from the engine to be replaced by a button, so the crank on the door panel seems headed for the same type of extinction. The power-operated window should be standard equipment on even the lower-priced cars within the next decade.

Since the end of the war over 1.5 million cars have been equipped with one or more power devices. Lincoln reports 86.5 per cent of its April production will be equipped with electric windows. Firms like Dura Division of Detroit Harvester Co. which supplies the hydraulic window regulators for GM's Fisher bodies have watched their sales grow 50-75 per cent since the end of the war. Old line auto firms like Houdaille-Hershey, now producing the electric actuator mechanism for the Lincoln power seat, have entered the field.

Push Button Age—There's little doubt about it, power devices for the auto body are on the move. With his zest for juke box bodies, it figures that Harry Horsepower would make a fetish of push buttons. No doubt, too, there's something fascinating about watching those back windows moving up and down obediently. But the chief reasons for the growth ahead in power devices for auto bodies are three, say proponents: 1. Good times have served to introduce people to power devices while they could afford to experiment. Now they'll be reluctant to give up the luxury. 2. The greater width of auto bodies has made the stretch to adjust those starboard windows prohibitive. 3. Like the power steering, power brakes and automatic transmission, the power windows and other body devices make the car easier for the little woman to operate.

For the Common Man—An observation might be added here that the power window and power seat are moving from the class of luxury to convenience. As soon as a convenience has the right price, it becomes a necessity. With such units as that now under development by Trico Products Corp. to sell for $15 per door installed, the statement that low-priced cars will soon have them does not seem unreasonable.

Uncrowded — The power device field is not yet crowded. Dura Division of Detroit Harvester, in addition to supplying General Motors, handles Hudson and Packard hydraulic window and seat adjuster requirements. F. L. Jacobs Co. supplies 25 per cent of Lincoln's electric windows and the Ford convertible top mechanism as well as a bulk of the electric seats produced. Hupp Corp. builds 50 per cent of Chrysler's electric windows and about 75 per cent of Lincoln-Mercury requirements. Electric Auto-Lite makes the remaining 50 per cent of Chrysler's needs.

All of these companies and Trico Products are experimenting with all methods of power device actuation—hydraulic, electric and vacuum—and the Battle Royal is centering around which of the three is the most reliable, economical and satisfactory. At a recent SAE meeting in Detroit, three exponents championed their causes.

The Arguments—Said E. C. Horton, chief engineer of Trico Products: "The pneumatic system as a tube mill product is the easiest to manufacture, utilizes the free energy of manifold vacuum and will outlast the life of the car. We supply a double-acting self-locking piston which works in a tube. Low amperage is used to crack open an air port. Atmospheric pressure pushes the window up or down. A stand-by unit called the 'Electro-Vac' (a small motor-driven compressor) is used as an auxiliary to the engine manifold. This gives window operation when the engine is shut off or when its throttle is wide open."

Speaking for the electric school was Paul B. Best, general sales manager of Hupp: "Electrically operated units have met with acceptance due to readily available, nearly constant source of power, their relatively slight maintenance

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

requirements and their ease of installation. The independence of each electrical unit reduces to an absolute minimum the possibilty of any serious inconvenience to the car owner in the event of difficulty of any sort. Electric window regulators provide positive power drive in both directions of window travel."

Representing the hydraulic advocates was John B. Parsons, chief engineer, Hydro-Electric Engineering Department, of Dura: "A single large electric motor compressing hydraulic fluid may be used to operate any reasonable number of moveable units. The starting motor of a car has been used to drive the hydraulic pump directly as a means of cheapening the system. A fluid and wire conducting hinge has been developed as a means of conducting the fluid and current into the door. Electro-fluid systems offer the lowest cost and greatest simplicity."

Look! No Muscles—So the pitch goes, and it is a thing worth watching. The end result will be a power system mass produced at sufficiently low cost to find a place in your car of the not too distant future. Power windows, power convertible tops, power seats, power operated parking brakes, powered rear curtains for convertibles, a power operated deck lid lowered by the weight of the attached continental spare tire and power closure of the right hand front door from the driver's seat have all been tried successfully.

Muscles, thanks to Mr. Horsepower, are on the way out.

Car of the Week

The Kaiser is an automobile of apparent virtue. Styling puts it well up in the conversation whenever stylists get together. Interiors are refreshingly different and in the best modern taste. The padded dash with its absence of murderous knobs and the pop-out windshield are good safety features. Visibility is tops. Good body support supplied by the seats gives notable comfort on long trips.

The real puzzler concerning the Kaiser is its handling on the open road. Cornering is much better than average and body roll on curves is never out of hand. The car holds the road well at speeds up to 70 or 80 providing the surface is flat and there are no cross-winds. However, control is difficult to maintain at speed over deflective road surfaces or in gusts, despite the fact that the car has a good steering ratio. The problem seems to be a function of the steering geometry rather than looseness in the linkage and control at dead center suffers. At speeds of 50-60, incidentally, the condition was insignificant and control very good.

Summing up, the Kaiser is one of the few truly beautiful cars made in the United States today. As driven by the average motorist it probably stacks up as somewhat average in roadability and performance. The car is definitely a much better machine than its 18th sales position would tend to indicate, and in beauty, safety and comfort it rates near the top.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,557
March	746,933	525,024
April		570,464
May		542,559
June		542,478
July		226,134
August		322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Mar. 21	169,923	125,347
Mar. 28	181,749	132,850
Apr. 4	170,567	125,668
Apr. 11	176,782	123,180
Apr. 18	155,944	131,657
Apr. 25	166,000*	134,130

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

Chevrolet Expands

A major expansion of Powerglide manufacturing facilities which could ultimately double production is announced by T. H. Keating, Chevrolet general manager.

A second assembly line at the Cleveland plant is already operating with a skeleton crew and the expansion when completed late this year should involve machine tools to augment stamping production and fill out assembly potential on the second line.

Also announced by Mr. Keating is a new spring and bumper plant to be built at Livonia, Mich. Involved are a manufacturing building, office building and separate power house. Equipment will probably include heat treating facilities and an assortment of heavy forming and punch presses. Production is slated for June, 1954.

Employment of the Cleveland plant will be raised to 3715 by the Powerglide expansion while the new Livonia bumper and spring plant will employ 1000 on two shifts. Chevrolet employment currently stands at more than 90,000, an all-time high for Chevrolet's 26 manufacturing and assembly plants.

Exhaust Notes

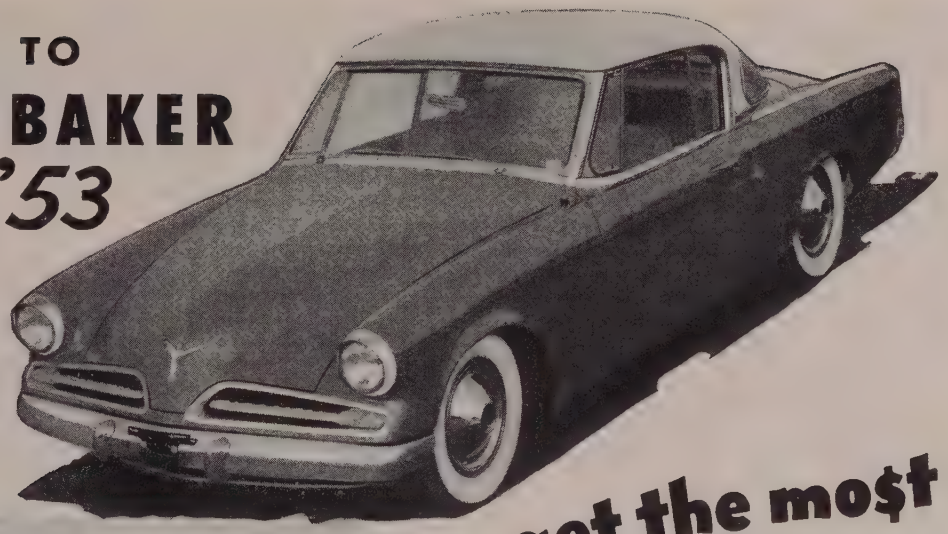
A static electricity ignition system for automobile engines requires no adjustment or tuning throughout its entire life. Heart of the new system is a static electricity generator invented in France. Final development work in adapting the system to American engines is being undertaken by Hackethorn Mfg. & Supply Co. Engine speeds up to 6000 rpm and compression ratios greater than 12 to 1 are claimed to be possible since breaker points, which limit engine speed, are not used. The high intensity, low-amperage current is also said to prevent spark plug fouling and burnt electrodes.

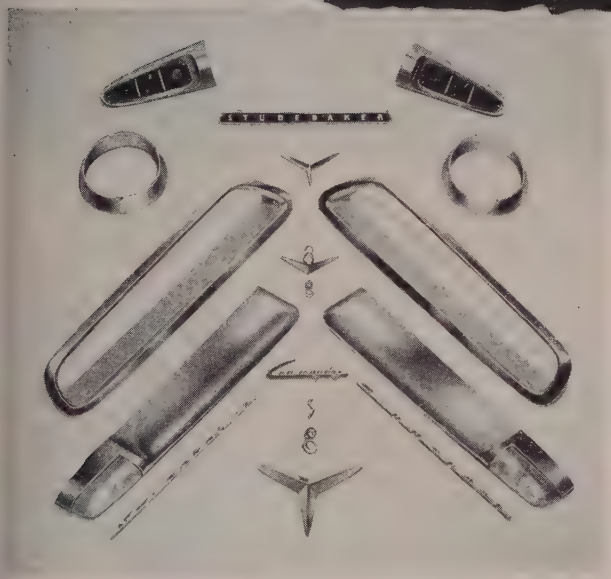
Reo produced its 100,000th Gold Comet truck engine this month while Buick built its 1.5 millionth Dynaflow transmission, a little more than five years after it was introduced.

"A good way to tell if your spark plugs are dirty is to look at them," says Carl T. Doman, national service manager of Ford Division. "If they are dirty on the outside, chances are they are dirty on the inside where it counts in gas mileage."

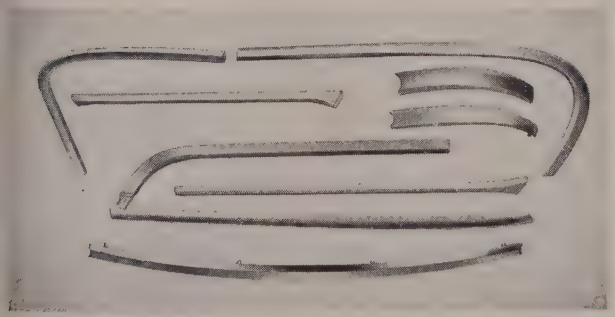
Reflecting the strong demand for labor in the Detroit area, job-switching has raised quits in the Detroit area to 32 per 1000, highest since October, 1950.

LOOK TO STUDEBAKER for '53





Many of the above ZINC Die Castings can be readily identified on the 1953 Studebaker front view. The other castings are employed on the rear deck and fenders. Castings pictured below are used on various Studebaker models, in keeping with the trend to more and more ZINC Die Cast window and body moldings.

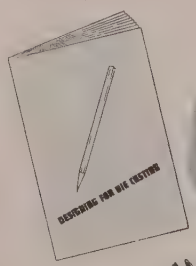


— get the mo$t for your Zinc Die Ca$ting Dollar!

While the new Studebaker breaks sharply with American contemporary design, reflecting the influence of European styling, the engineering continues to be based strictly on American mass production techniques. That means a widespread use of ZINC Die Castings.

From the low front profile to the fin-like rear fenders, the sleek new Studebaker models are "tailored" with the ZINC Die Castings shown at the left. The ability to die cast complex shapes with exacting dimensions in ZINC makes it possible not only to achieve unusual designs, but to produce the part to fit the body section, instead of vice versa. These production advantages, plus the ability to take and hold beautiful plated and enamel finishes, have made the automotive industry the largest consumer of ZINC Die Castings.

Ask any commercial die caster about the physical and mechanical advantages of ZINC over other die casting metals—or write to us.



Send for your copy

The New Jersey Zinc Company, 160 Front St., New York 38, N. Y.

ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

"R B & W took us off a *hot spot* by cold-forging this key fitting"

● *"You know how important that little fitting is, Joe,"* continued Mr. Tobin. *"It connects the oil line to this filter we* make, and it was this component that gave us one headache after another."*

"How did you clear up the trouble?" Joe asked, as he peered at the oil filter he had seen on so many cars.

"Well, these spuds, as they are called, used to be machined from bar stock. If there were checks or seams in the bar, the machining process failed to detect them. Realizing that spot checking would not eliminate our difficulty, we were forced to magnetically inspect every single spud. This magnetic inspection threw production costs out of line on such a small item. It also showed us that a sizeable part of our production had to be rejected, thus indicating that a change of the production method was necessary.

"Then one of our men thought of RB&W and it wasn't long before their engineers came up with the idea of cold-forging this fitting. Cold-forging made the spud stronger and eliminated the danger of cracking and leaking. It also made the fitting easier to weld to the filter. As a bonus, they even did away with one of the machining operations by forging a countersink at the same time they forged the fitting. Now we're getting better spuds at lower cost in less time — and we no longer need the magnetic inspection."

Maybe this sounds like a special case to you, but it puts in sharp focus RB&W's down-to-earth engineering skill, as well as our practical experience in designing and fabricating the kind of fasteners that can solve your assembly problems.

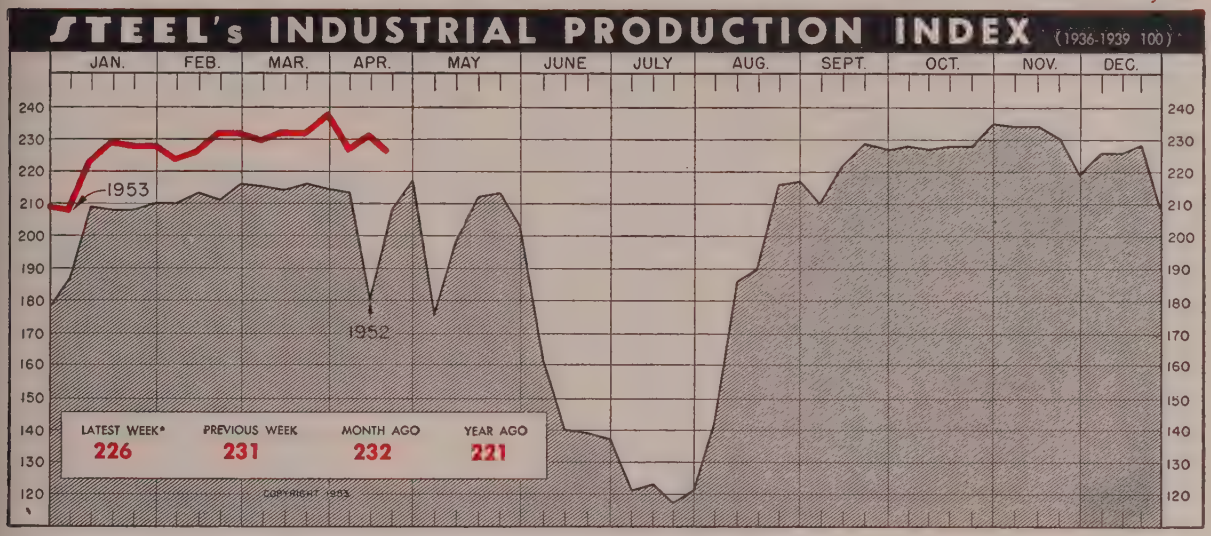
Most of your fastener requirements can be met with standard products from our stock. However, if the unusual is called for, we'll design and make it for you—as efficiently and quickly as we turned out a better spud for this filter manufacturer.

Remember—for any fastening job, it's a smart move to call in RB&W. You can count on RB&W bolts, nuts, screws, and rivets for uniform accuracy, dependability and physical properties. And you can also count on fast service from RB&W's strategically located plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Pittsburgh, Detroit, Chicago, Dallas, San Francisco. Sales agents at: Portland, Seattle. Distributors from coast to coast.

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

*Fram Corporation, East Providence, R. I.

R B & W 108 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG


STEEL's INDUSTRIAL PRODUCTION INDEX (1936-1939 100)
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
240 230 220 210 200 190 180 170 160 150 140 130 120
1953
1952
LATEST WEEK* 226
PREVIOUS WEEK 231
MONTH AGO 232
YEAR AGO 221
COPYRIGHT 1953

*Week ended Apr. 18

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

The metalworking industry is starting to recoup output lost earlier this month from walkouts. Production in May is expected to climb above the April level

INDUSTRIAL output is now regaining some of the velocity it lost earlier in April.

Brief walkouts in various industries this month have curtailed the nation's output a bit. STEEL's industrial production index declined in the week ended Apr. 18 to 226 per cent of the 1936-1939 average. This is a 12-point drop from the postwar record attained in late March and is the lowest rate since mid-February.

Signs indicate that clouds over the production scene are now starting to thin out. Most key barometers of industrial operations are rising and are expected to climb in the next few weeks.

Slight Rise — Steel production is inching up, after a setback in early April. In the week ended Apr. 4, steel operations were running at the lowest rate (95 per cent) since August, 1952, when the industry was recovering from the steel strike. Most of the April decline was due to striking railroad and steelworkers plus the closedown of a large open-hearth facility in the Pittsburgh area.

Automotive operations are starting an upclimb, following a week of scattered walkouts. Output of passenger cars and trucks declined in the week ended Apr. 18 to the lowest level in over two months. Strikes were soon ended, however.

Electricity production—a good industrial bellwether—is rising far above output a year ago. Last fall, utilities generated about 7 per cent more electricity than in the comparable weeks of a year earlier. Since then, the over-the-year increase has climbed to about 11 per cent.

Uptrend Ahead? — Since most prime indicators are pointing upward, industrial velocity may achieve considerably more momentum in the next few weeks. Production in May, while above the April level, probably won't rise above March, the traditional high-point in first-half turnout.

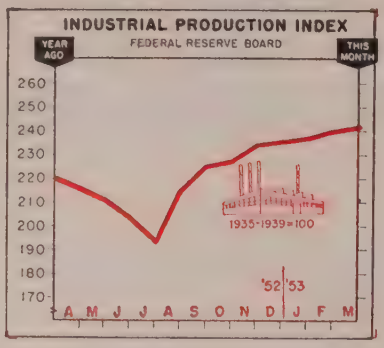
Auto Output To Rise . . .

The automotive industry is bending every effort to make the first half of 1953 the largest six-month production period in motordom's history. To attain this goal, auto companies in the weeks ahead must regain production lost this month. U. S. plants in the week ended Apr. 18 assembled 144,307 passenger cars and trucks, or 20,625 below the previous week's turnout, says *Ward's Automotive Reports*. High-point in 1953 operations came in the week ended Mar. 28, when U.S. car production reached 170,870 passenger cars, marking the best weekly volume in over two years.

U.S. and Canadian companies in the week ended Apr. 18 produced 155,944 passenger cars and trucks, compared with 176,782 units in the previous week and 131,657 units in the week ended Apr. 19, 1952.

Pay Envelopes Fatter . . .

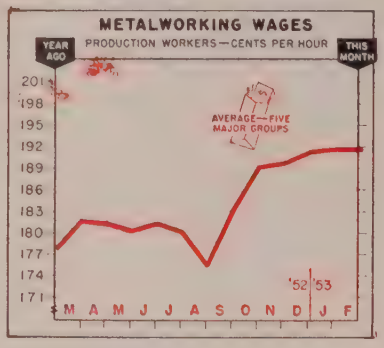
Earnings of production workers are continuing to move upward as overtime payments increase. The Bureau of Labor Statistics says that the average weekly earnings of factory workers rose nearly $1 between mid-February and mid-March. Weekly earnings increased in all metalworking industry groups, with transportation equipment workers making the largest gain — reflecting the near-record levels of automobile production. Production workers in the primary metals industry averaged $83.43 per week, up $6.84 from a year earlier. Workers in the fabricated metal products group were paid an average of $77.78 per week, or $6.64 over the same period in 1952. Earnings in the nonelectrical ma-



Industrial Production Index
1935-1939=100

	Total Production 1953	Total Production 1952	Iron, Steel 1953	Iron, Steel 1952	Non-ferrous 1953	Non-ferrous 1952
Jan.	236	220	287	261	249	215
Feb.	239	222	291	261	253	217
Mar.	241	220	...	262	...	218
Apr.	...	216	...	245	...	219
May	...	211	...	245	...	220
June	...	203	...	142	...	212
July	...	193	...	141	...	201
Aug.	...	215	...	241	...	212
Sept.	...	225	...	267	...	221
Oct.	...	227	...	276	...	228
Nov.	...	234	...	283	...	240
Dec.	...	235	...	287	...	245
Avg.	...	218	...	243	...	220

Federal Reserve Board

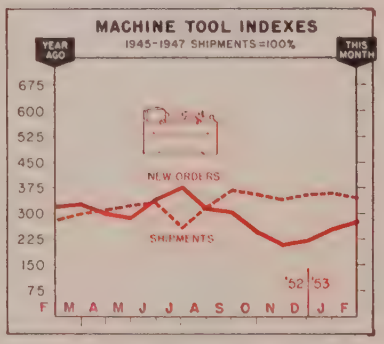


Metalworking Wages
(cents)

Production Workers—Five Major Groups

1952	Prim. Mtls.	Fab. Prod.	Mach-inery	Elec. Mchy.	Trans. Equip.
Jan.	184.7	170.3	182.0	166.9	191.4
Feb.	183.1	170.5	183.0	166.8	190.3
Mar.	184.8	171.5	184.1	169.5	193.4
Apr.	183.0	170.9	183.6	169.5	193.0
May	184.0	171.9	184.0	169.5	192.4
June	183.0	171.5	184.7	170.4	194.0
July	181.3	170.0	184.4	169.5	194.0
Aug.	193.7	172.4	184.5	171.6	194.8
Sept.	199.1	176.3	187.1	173.6	200.5
Oct.	199.0	178.9	188.5	173.0	203.7
Nov.	200.0	179.4	190.1	173.2	204.3
Dec.	201.0	181.1	192.8	173.9	206.5
1953					
Jan.	201.1	181.4	192.8	174.0	204.2

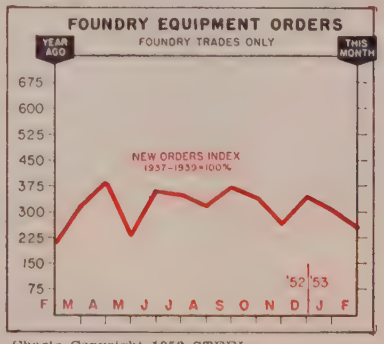
U. S. Bureau of Labor Statistics



Machine Tool Indexes
1945-1947 Shipments=100

	New Orders 1953	New Orders 1952	Shipments 1953	Shipments 1952
Jan.	255.8	347.8	361.6	266.6
Feb.	288.2	318.8	354.1	279.6
Mar.	....	....	....	299.5
Apr.	....	....	....	307.9
May	....	....	....	323.0
June	....	....	....	330.8
July	....	....	....	259.7
Aug.	....	....	....	317.0
Sept.	....	....	....	368.3
Oct.	....	....	....	357.8
Nov.	....	....	....	342.5
Dec.	....	....	....	355.0

National Machine Tool Builders' Assn.



Foundry Equipment Orders

	Index (1935-1939=100) 1953	Index (1935-1939=100) 1952	Value, Thousands 1953	Value, Thousands 1952
Jan.	301.0	404.5	$1,379	$1,862
Feb.	257.3	200.4	1,179	922
Mar.	....	310.0	....	1,427
Apr.	....	385.1	....	1,773
May	....	225.2	....	1,037
June	....	353.8	....	1,629
July	....	243.9	....	1,583
Aug.	....	311.6	....	1,434
Sept.	....	365.9	....	1,685
Oct.	....	335.8	....	1,538
Nov.	....	258.1	....	1,183
Dec.	....	343.3	....	1,573

Foundry Equipment Mfrs. Assn.

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Apr. 6	Gray Iron Castings..Apr. 20	Ranges, Gas .....Mar. 30
Durable Goods ....Mar. 30	Ironers .....Apr. 13	Refrigerators .....Feb. 2
Employ., Metalwk..Mar. 30	Malleable Castings..Apr. 20	Steel Castings ....Apr. 20
Employ., Steel ....Apr. 6	Pumps .....Apr. 6	Steel Forgings ....Apr. 20
Fab. Struc. Steel..Mar. 30	Prices, Consumer..Jan. 26	Steel Shipments ..Nov. 3
Freight Cars .....Mar. 23	Prices, Wholesale..Apr. 13	Vacuum Cleaners..Mar. 23
Furnaces, Indus. ..Apr. 6	Radio, TV .....Apr. 13	Washers .....Mar. 30
Gear Sales .....Mar. 9	Ranges, Elec. .....Apr. 13	Water Heaters ....Mar. 30

chinery industry rose $4.19 per week to $84.05 per week. Electrical machinery workers averaged $72.80 per week, up $4.24 from a year earlier. Transportation workers earned an average of $86.51 per week, some $6.19 more than they averaged weekly between mid-February and mid-March, 1952.

Steel Output Edges Up . . .

The American Iron & Steel Institute estimates that 2,238,000 net tons of steel for ingots and castings were produced in the week ended Apr. 25, or about 10,000 tons over the previous week's total.

Sweeper Sales Up . . .

The vacuum cleaner industry, like many appliance makers, is drawing in far more sales than it did a year ago. The Vacuum Cleaner Manufacturers Association says that factory sales of standard-size household vacuum cleaners in the first quarter showed an increase of 9.9 per cent over the same months of 1952, totaling 831,187 units compared with 756,254 units. Sales in March amounted to 329,294 units, up 13.5 per cent over the same month of last year and 33.9 per cent higher than vacuum cleaner sales in February, 1953.

Retail Sales Steady . . .

Retailers are hauling in a sales volume about 7 per cent larger than at this time last year, although figures sometimes might lead you to believe otherwise. An example is the over-the-year drop of 13 per cent in department store sales recorded by the Federal Reserve Board for the week ended Apr. 11. Reason for this 13 per cent decline: Easter came a week later in 1952.

Locomotive Orders Skid . . .

New orders for locomotives are rumbling downhill fast as many roads complete their current dieselization programs. The Association of American Railroads says that on Apr. 1 Class 1 railroads had 853 units on order. These included 814 diesel-electric units, ten steam, ten electric and

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	97.0	98.0	96.5
Electric Power Distributed (million kwhr)	8,010[1]	8,001	7,104
Bituminous Coal Output (daily av.—1000 tons)	1,403	1,179	1,342
Petroleum Production (daily av.—1000 bbl)	6,275[1]	6,268	6,365
Construction Volume (ENR—millions)	$275.0	$195.1	$235.1
Automobile, Truck Output (Ward's—units)	155,944	176,782	131,657
TRADE			
Freight Car Loadings (unit—1000 cars)	725[1]	721	735
Business Failures (Dun & Bradstreet, number)	155[1]	140	188
Currency in Circulation (millions)[3]	$29,753	$29,780	$28,436
Dept. Store Sales (changes from year ago)[3]	−13%	+8%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,667	$16,074	$15,708
Federal Gross Debt (billions)	$264.4	$264.4	$257.5
Bond Volume, NYSE (millions)	$14.8	$20.9	$14.2
Stocks Sales, NYSE (thousands of shares)	7,033	10,278	8,102
Loans and Investments (billions)[4]	$76.9	$76.8	$72.9
United States Gov't. Obligations Held (billions)[4]	$29.7	$29.5	$31.0
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	226.0	229.3	243.6
All Commodities[7]	109.5	109.6	112.3
All Commodities Other Than Farm and Foods[7]	113.3	113.2	113.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

19 gas turbine-electric locomotives. These railroads on Apr. 1, 1952, had 1739 new locomotives on order, of which 1714 were diesel-electric, 16 were steam and 9 were gas turbine-electric units.

In the first quarter, Class 1 roads installed 574 locomotives; all but five were diesel operated units. In the same period of 1952, installations totaled 920 units—914 diesel-electric, three steam, two electric and one gas turbine-electric.

Construction Awards Rise . . .

Plenty of work lies ahead this year for the nation's construction firms. Contracts awarded for heavy construction in 1953 by Apr. 16 totaled $4.9 billion, an all-time high and 28 per cent above the same period in 1952, says *Engineering News-Record.* Homebuilding and public road and building contracts have been the brightest stars in the 1953 awards picture. Industrial construction is declining from a year ago.

Coal Market Softens . . .

With industrial stockpiles high and more consumers switching over to other fuels, soft coal production is lagging about 19 per cent under a year ago. The National Coal Association, from incomplete car loading reports from railroads, estimates bituminous coal production in 1953 by Apr. 11 at around 121.8 million tons, compared with 149.2 million tons produced in the comparable weeks in 1952.

Primary Prices Decline . . .

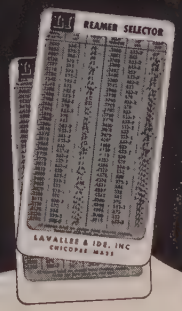
Wholesale prices have dropped considerably in the last year, but most of the decline has been in agricultural products. The Bureau of Labor Statistics says that prices of all commodities declined 2.5 per cent in the year ended Apr. 14. Farm products, processed foods and meats declined about 13 per cent while all other commodities declined only 0.4 per cent over the year.

Trends Fore and Aft . . .

Freight car loadings are running about 4 per cent above the same weeks of 1952 . . . Sales in the first quarter of the Pressed Steel Car Corp. broke all previous quarterly records by attaining $26.8 million . . . Unit shipments of steel boilers in 1952 dropped 11 per cent from the previous year . . . Factory sales of mechanical stokers fell 4 per cent in 1952.

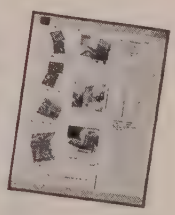
THERE'S NO DOUBT ABOUT L&I REAMERS

It's easy to choose the right reamer with the NEW Reamer Selector



It's easy to get complete specifications of all L&I Reamers in the NEW illustrated catalog

It's easy to find the exact price to you in the new illustrated NET Price List



It's easy to get complete data on reamer selection, specifications and prices, too. Mail the coupon NOW!

L&I *The Reamer Specialists*

LAVALLEE & IDE, INC.
CHICOPEE, MASS.

I'd like _____ Reamer Selectors
_____ New Catalogs _____ Net Price Lists.

Name _____ Pos _____
Company _____
Street _____
City _____ Zone _____
State _____
3

ANNOUNCING 4 NEW CUTTING OILS!

2 DUAL-PURPOSE OILS (lubrication and cutting)

SUNICUT 11-S for medium duty on automatic screw machines

SUNICUT 209-S for heavy duty on automatic screw machines

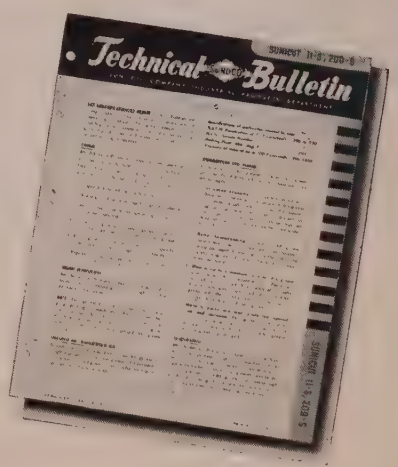
2 SINGLE-PURPOSE OILS (cutting only)

SUNICUT 102-S for heavy duty on automatic screw machines

SUNICUT 110-S for heavy duty service in broaching, threading, gear cutting, heading and similar applications

All four oils keep parts and tools cooler, help maintain closer work tolerances, permit longer runs between tool dressings. All are odorless and light in color. In addition, Sunicut 11-S and 209-S have high lubricating value and are nonstaining.

For your copies of the technical bulletins describing these new oils, call the nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. S-4.



INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

SUNOCO®

PHILADELPHIA 3, PA. ◆ SUN OIL COMPANY LTD., TORONTO & MONTREAL

Men of Industry

J. HOWARD DUNN
. . . mgr. of Alcoa's Cleveland div.

T. G. BARNES
. . . gen. sales mgr., Firth Sterling

FRED W. NIGGEMYER
. . . Harlan Electrical v. p.-sales

J. Howard Dunn was named manager of the Cleveland sales development and engineering division for **Aluminum Co. of America.** He succeeds **Frank Jardine,** now a consultant in automotive engineering and other problems. **George L. Moore,** chief of design engineering at Cleveland, succeeds Mr. Dunn as assistant manager, development division.

Hermon L. Underhill joined **Pivot Punch & Die Corp.,** North Tonawanda, N. Y., as assistant to the president. He has been a director since 1947. He resigned in February as executive vice president, treasurer and director of A. E. Bausenbach Inc.

Inland Steel Co., Chicago, promoted **Robert M. Buddington** to assistant general manager of sales, and **Derrick L. Brewster** as manager, Chicago sales office.

R. B. Crean resigned as vice president, Eddystone Division, Baldwin-Lima-Hamilton Corp., to become administrative assistant to the president of **Ingersoll Products Division,** Borg-Warner Corp., Chicago.

Dr. T. H. Troller resigned Apr. 15 as engineering vice president, **Joy Mfg. Co.,** Pittsburgh, but continues in a consulting capacity.

Firth Sterling Inc., Pittsburgh, appointed **T. G. Barnes** general sales manager. Formerly with Reynolds Metals Co., he joined Firth Sterling in 1950 and a year later became production manager. He is succeeded in the position by **G. A. Wilson,** formerly general superintendent, carbide division.

Gen. Harlan L. Mumma, U. S. Army (ret.), was made executive vice president in charge of all operations of **Zenite Metal Corp.,** Indianapolis, a subsidiary of Black, Sivalls & Bryson Inc. For the last five years he has served the parent company as export and eastern sales manager at New York.

Hugh C. Armstrong, since 1942 vice president-general manager, **Williams & Co. Inc.,** Pittsburgh, was elected president. **C. C. Kleinschmidt** was made vice president, assistant general manager. **Harold E. Williams,** for 46 years executive head of the company, retires from active duties as president, and assumes the position of chairman of the board.

Robert M. Drysdale Jr. was appointed vice president and general sales manager, **Virginia Metal Products Corp.,** Orange, Va. He resigned as executive vice president, Federation For Railway Progress.

Fred W. Niggemyer was made vice president-sales at **Harlan Electrical Construction Co.,** Toledo, O. Before joining the executive staff of the company, he was sales manager for McDowell Co., Cleveland.

Borje Rosaen was appointed sales manager, Hydreco Division, Cleveland, **New York Air Brake Co.** He continues as sales manager of the Dudco Division, Hazel Park, Mich., acquired by the company in 1951.

John R. Welsh was made purchasing agent for ferrous scrap, **American Brake Shoe Co.,** New York. **John Brandenburg** was made central sales manger, American Manganese Steel Division, located at Chicago Hts. Ill.

Milton J. Hassan was elected vice president, engineering and operations, trackwork division, **Taylor-Wharton Iron & Steel Co.,** Cincinnati.

At **United States Rubber Co., Edward T. Day** was named manager of branch sales for the mechanical goods division and **Matthew J. Delehaunty,** manager of industrial sales. Both men will be headquartered in the New York offices.

National Radiator Co., Johnstown, Pa., established a new factory branch sales office at 960 W. St.

CARL J. DEMRICK
. . . Plymouth gen. mfg. manager

DR. GERALD V. KINGSLEY
. . . Bohn Aluminum research supervisor

Clair Ave., Cleveland, and named **Robert G. Harrison** manager.

Carl J. Demrick was named general manufacturing manager, Plymouth Division, **Chrysler Corp.**, Detroit. **Charles F. Vandekerck** becomes staff master mechanic at Chrysler.

S. L. Crawshaw is the new president of **Amgears Inc.**, subsidiary, Hupp Corp., and executive head of its Chicago operations. For the last ten years he has held executive positions with Western Gear Works, and this year is also serving as president of American Gear Manufacturers Association. Mr. Crawshaw's name was incorrectly spelled in the Apr. 20 issue.

Promotions in the research division, **Bohn Aluminum & Brass Corp.**, Detroit, include **Dr. Gerald V. Kingsley** as research supervisor and **Edward O. Falberg** as production metallurgy supervisor. Both will serve as assistants to **W. E. McCullough**, chief metallurgist.

Dravo Corp., machinery division, Pittsburgh, appointed **Philip J. Berg** to its Detroit office to supervise the sale of Dravo Counterflo heaters, crane cab coolers, fabricated piping and construction projects in Michigan.

John R. McVeigh joined the research and development staff of **Alloy Engineering & Casting Co.**, Champaign, Ill., as chief engineer. For the last three years he was research engineer, Kennametal Inc.

Sioux Steel Co., Sioux Falls, S. Dak., appointed **Edward H. Mark** works manager. He formerly was plant superintendent for Universal Steel Equipment Corp.

Hector J. Dowd, vice president, **Avco Mfg. Corp.** and former board chairman, **Bendix Home Appliances Inc.**, succeeds **Judson S. Sayre**, who is resigning as Avco vice president and general manager, Bendix Home Appliances Division, but continues as a consultant. Mr. Dowd, who also becomes general manager, American Kitchens Division, will headquarter in South Bend.

Inland Steel Co., Chicago, appointed four men to new posts in its sales organization. **M. S. George** and **Harold J. Kreher** became sales managers, railroad division, and pig iron and coal chemical division, respectively — new departments created from the former railroad, pig iron and chemical division. **Roger S. Bullard** was named assistant manager of sales, pig iron and coal chemical division, while **Harry R. Johnson** replaces Mr. George as manager, New York sales office.

Acme Steel Co., Chicago, appointed **Walter F. Hinkle** director of engineering and research, and **James N. Wognum** chief engineer of the newly created engineering research

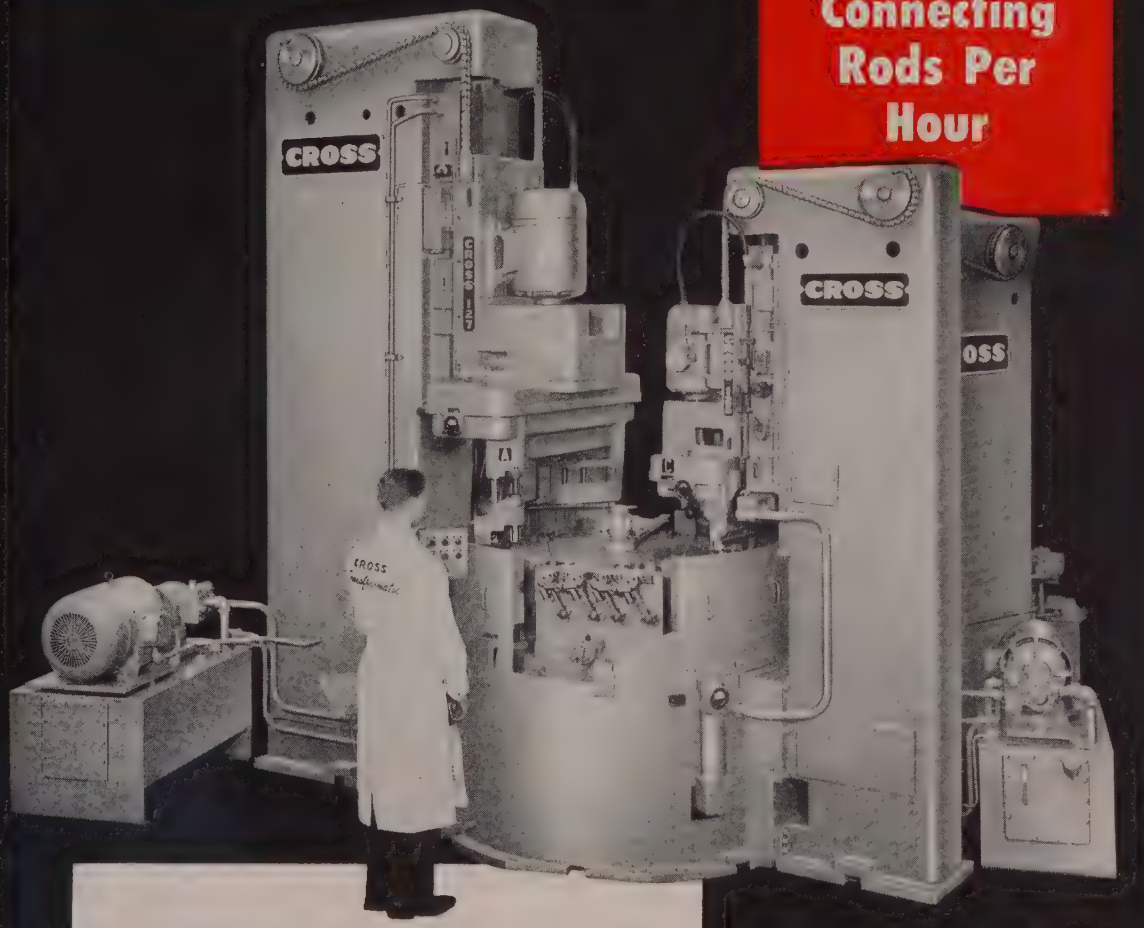
S. L. CRAWSHAW
. . . new president of Amgears

JOHN R. McVEIGH
. . . joins Alloy Eng. & Casting

WALTER F. HINKLE
. . . Acme Steel eng.-research director

Another Special by Cross

Mills, Drills 600 Connecting Rods Per Hour



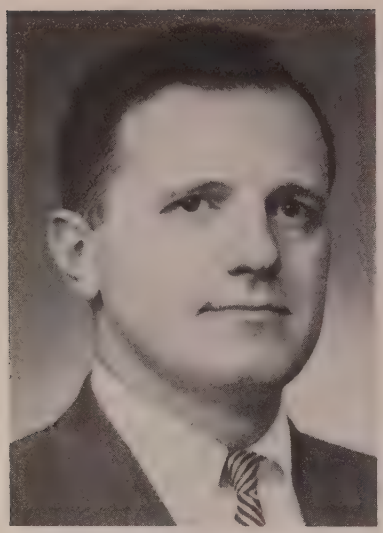
- ★ Drills stepped oil hole and mills lock slot of 600 connecting rods per hour at 100% efficiency.
- ★ Fluid motor driven index table.
- ★ Five stations—one for loading, one for milling and three for drilling.
- ★ Hydraulically operated work holding fixtures.
- ★ Pre-set cutting tools.
- ★ Other features: Hydraulic feed and rapid traverse; hardened and ground ways, J.I.C. standard construction.

Established 1898

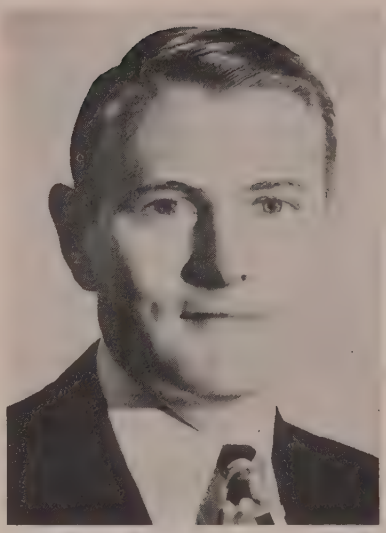
THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS



CHARLES F. VENRICK
. . . position at American Locomotive



JOHN V. EAKIN
. . . Fawick Airflex gen. mgr.

HORACE Y. BASSETT
. . . Calumet & Hecla v. p.-operations

laboratory located at 7439 S. Ashland Ave., Chicago.

American Locomotive Co., Schenectady, N. Y., appointed **Charles F. Venrick** manager, Alco-GE locomotive sales and field service, and **Ralston A. Weston** manager of stationary and marine diesel engine sales. Both men will report to **John P. DeLaney**, general manager, transportation services, to whose immediate staff **John W. Linford** has been added.

F. S. Cornell was elected executive assistant to the president of **A. O. Smith Corp.**, Milwaukee. He continues as manager, Permaglas-Heating Division, Kankakee, Ill.

M. M. Schratz, controller of **Aluminum Co. of America**, Pittsburgh, was elected to a newly created vice presidency.

Federal Fawick Corp., Cleveland, appointed **John V. Eakin** general manager, Fawick Airflex Division, and **Theodore E. Metz** as advertising manager. Mr. Eakin, who joined the company in 1943, has most recently served as assistant general manager of the division which manufactures industrial clutches, brakes and related products.

A. E. Terry was named assistant general superintendent, Geneva Works, **Columbia-Geneva Division, U. S. Steel Corp.** He was formerly division superintendent-coke and by-products at the Geneva Works, Geneva, Utah.

Gilbert L. Holt was appointed works manager, Berwick, Pa., plant, **American Car & Foundry Co.** He has been serving as production manager.

Calumet & Hecla Inc., Chicago, elected **Horace Y. Bassett** vice president of operations. Since 1948 he has been vice president-general manager, Wolverine Tube Division, Detroit. He now transfers headquarters to the new C&H executive offices recently opened in the People's Gas building, Chicago. **Don W. Blend** is now general manager, Wolverine Tube Division. **C. Chester Jung** joins the company May 1 as vice president-finance, and **Francis J. Gibbons** was made controller.

Motor Products Corp., Detroit, appointed **Leonard A. Stewart** to the newly created position of director of engineering, automotive division.

Arthur D. Chaffee was promoted to superintendent, mechanical maintenance departments, **Scovill**

(*Please turn to Page* 151)

OBITUARIES...

Frank Purnell, 66, chairman of the board of **Youngstown Sheet & Tube Co.**, Youngstown, died Apr. 19. He relinquished the presidency of the company in 1950, a position he had held for 20 years.

Charles Heggie, 74, retired president, **Scully Steel Products Co.**, Chicago, died Apr. 11.

Charles W. Lusk, 66, research engineer for **Bendix Co.** at Los Angeles, died Apr. 8.

William C. Royal, 48, Cleveland representative of **Selas Corp. of America**, died Apr. 9.

Emmett A. Williams, 62, vice president, **National Bearing Division**, St. Louis, American Brake Shoe Co., died Apr. 14.

Neil A. Benson, 52, plant manager for **Hagan Corp.**, Pittsburgh, died Apr. 12.

Richard A. Belke, 56, owner, **Artcraft Iron Works**, Buffalo, died Apr. 12.

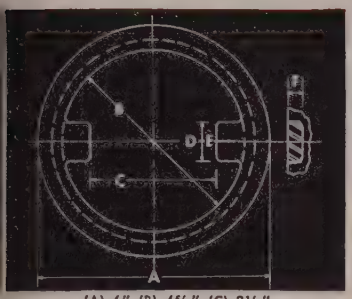
C. W. Hadden, 70, who retired in September as president, **Kelvinator of Canada Ltd.**, died Apr. 14 in Phoenix, Ariz.

Richard E. Newman, 54, senior partner, **Dick Newman Piston Ring Co.**, Philadelphia, died Apr. 17.

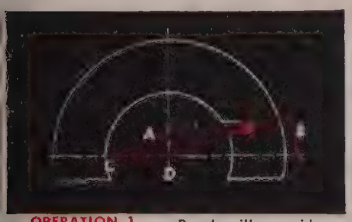
Charles C. Cowan, 69, partner in **Cowan & Williamson**, Buffalo, tool and die maker, died Apr. 10.

Carl A. Wolf, 48, production manager of **Consolidated Packaging Machinery Corp.**, Buffalo, died Apr. 10.

Production time reduced by 53%!



(A) 6" (B) 4⅝" (C) 3¼"
(D) —1" + ± .000
(E) —1" + ± .005 (F) ⅜"



OPERATION 1 — Rough mill one side of tongue.

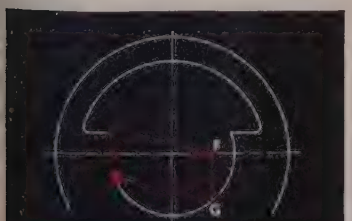
PROCEDURE—Offset spindle slide radius (A), set rotary head to angle (B), feed table to work-piece centerline (C to D).

OPERATION 2 — Rough mill radius section between tongue.

PROCEDURE — Rotate head from angle (B) to angle (E).

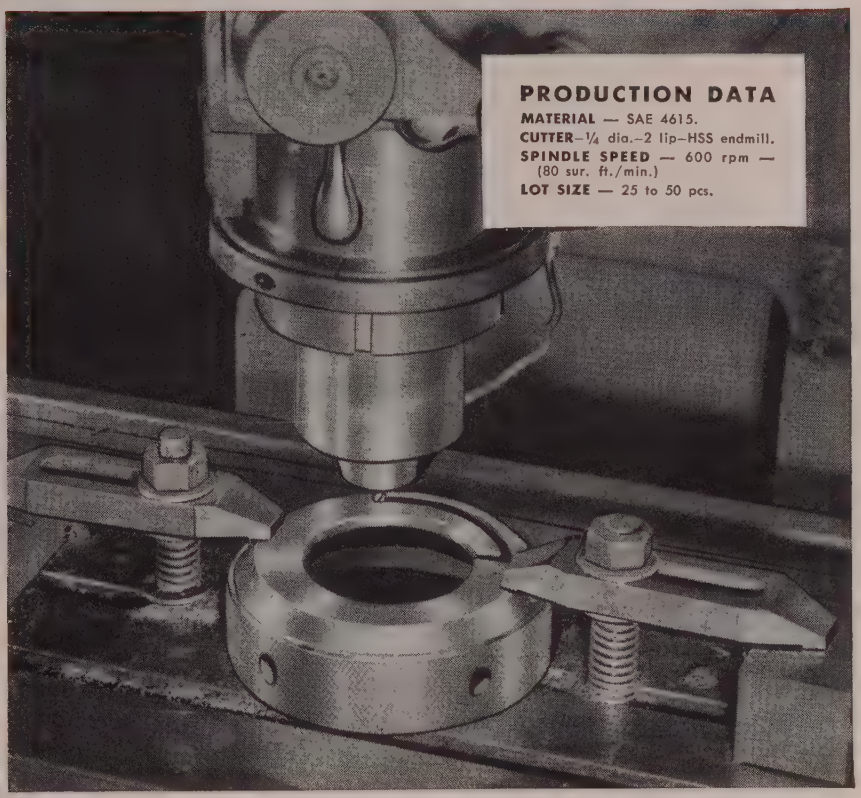
OPERATION 3 — Rough mill one side of opposite tongue.

PROCEDURE — Feed Machine table from (D) to (F).



OPERATION 4 — Rough mill end of tongue.

PROCEDURE — Feed machine saddle from (F) to (G).

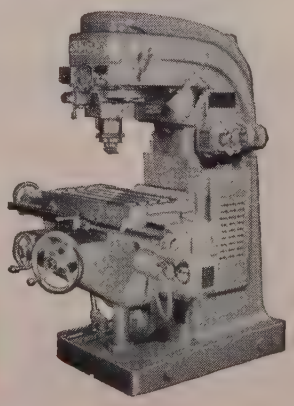


Rotary Head Milling Machine simplifies method, cuts costs on still another production job.

IN the production milling of this Quick Change Clamp Collar, considerable savings were effected by using a Kearney & Trecker No. 2 Model D Rotary Head milling machine. The entire milling operation on each piece required less than 16 minutes and still maintained the prescribed accuracy. Previous time was 34 minutes.

The job was done faster on the Rotary Head machine than would be possible with any other method. The radii were produced merely by offsetting the spindle slide and rotating the machine's head. The straight surfaces were milled by moving the table and saddle, both of which are independent of the head setting. Only one cutter was used in this single set-up. Think of what this means not only in this job, but also in terms of increased range of operations for other work.

Get the Rotary Head Milling Machine Production Idea Booklet. It contains several examples of how this method has been found exceptionally efficient in solving production problems. It's yours for the asking. Write Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.



OPERATION 5 — Rough mill second half of inner contour.

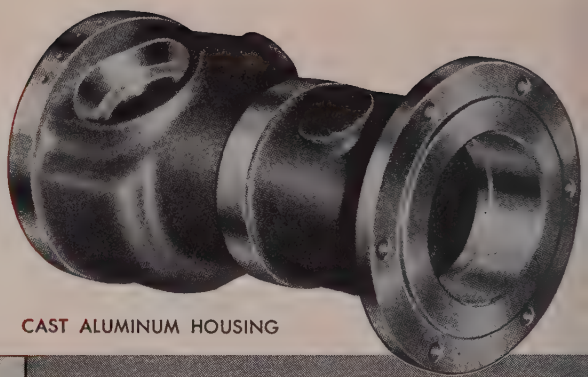
PROCEDURE — Repeat Operations 1 through 4, working area to be in the lower half of opening.

OPERATION 6 — Finish mill 4¾" dia., end of tongues to 3¼" dimension and width of tongues to 1" + .000 —.005.

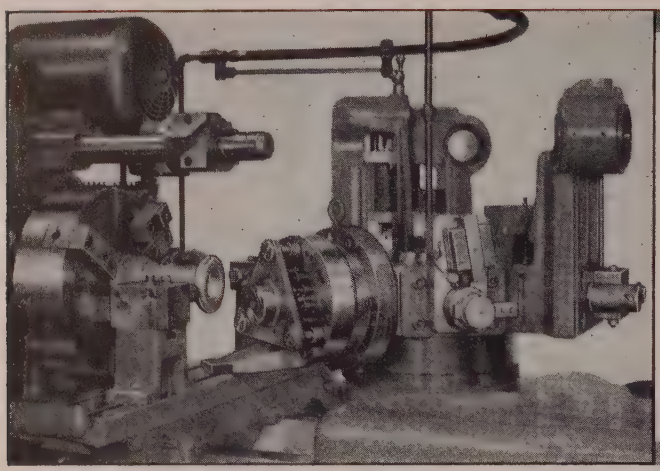
PROCEDURE—Reverse sequence of Operations 1 through 5.

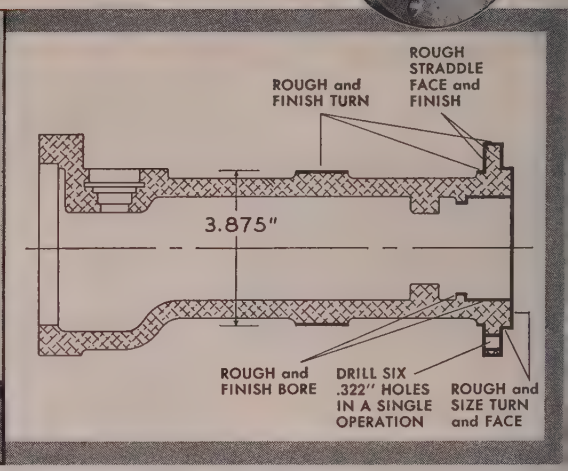
KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

Not Just a Hole in One—
but 6 IN ONE...
SIMULTANEOUSLY!



CAST ALUMINUM HOUSING



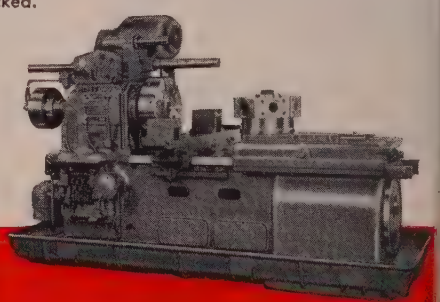

ROUGH and FINISH TURN
ROUGH STRADDLE FACE and FINISH
3.875"
ROUGH and FINISH BORE
DRILL SIX .322" HOLES IN A SINGLE OPERATION
ROUGH and SIZE TURN and FACE

SURFACES MACHINED ARE INDICATED BY HEAVY LINES

On a 5-DE POWER-FLEX
Automatic Turret Lathe teamed with P&J TOOLING

An unusual job? No, not for that great production team, a P&J Automatic *plus* P&J Tooling, that has taken hundreds of other tough jobs like this in its stride . . . and done them faster, better and more profitably. The ingenious, time-saving set-up shown here makes use of a slide tool — operated by the cam on the overhead pilot bar — to machine the two 3.875" diameters which are smaller than the flange diameter nearest the turret. Notice too that all six holes in the flange are accurately located and drilled simultaneously in a single operation. This is made possible by using a special P&J Multiple Spindle Drill Head that is automatically indexed into position and locked.

If you'd like to produce your hard-to-machine jobs quicker and more accurately with fewer rejects and greater profits, let the P&J Team go to bat for you. **Send today for your copy of the 5D POWERFLEX Bulletin No. 131 . . . or ask P&J Tool Engineers to submit recommendations based on your own prints or sample parts.**



POTTER & JOHNSTON Co.
PAWTUCKET, RHODE ISLAND
SUBSIDIARY OF
PRATT & WHITNEY
DIVISION NILES — BEMENT — POND COMPANY

P&J

WRITE DIRECT OR CONTACT YOUR NEAREST PRATT & WHITNEY BRANCH OFFICE

BIRMINGHAM • BOSTON • CHICAGO
CINCINNATI • CLEVELAND • DETROIT
LOS ANGELES • NEW YORK • PHILADELPHIA
PITTSBURGH • ROCHESTER • SAN FRANCISCO • ST. LOUIS • EXPORT DEPT., PAWTUCKET, R. I.

AGENTS: DALLAS, THE STANCO CO., HOUSTON, WESSENDORFF, NELMS & CO.

Steel Firms Merge

Federated Steel Corp. buys Morrison-Drabner Steel Co. Inc. of Cincinnati and Atlanta

FEDERATED STEEL CORP., Pittsburgh, will purchase the business of Morrison-Drabner Steel Co. Inc., Cincinnati and Atlanta, as of Apr. 30. The corporation will make the acquisition through two newly formed and wholly owned subsidiaries, Morrison-Drabner Steel Co., which will handle the Cincinnati operation, and Federated Steel Co., which will handle the Atlanta operation.

Both Federated Steel and Morrison-Drabner are processors and distributors of steel and aluminum products. Federated presently operates two warehouse plants: Fort Duquesne Steel Co., Pittsburgh, and Hamilton Steel Co., Cleveland.

Officers Named—Donald C. Lott, president of Federated, will be president and treasurer of the new Morrison-Drabner Steel Co. while Andrew R. Cochrane, vice president and secretary of Federated, will serve as secretary. William S. Walker will be elected vice president and general manager of the firm. Roger Morrison and Victor Drabner will join the Federated organization in advisory capacities and will continue to be located in Cincinnati.

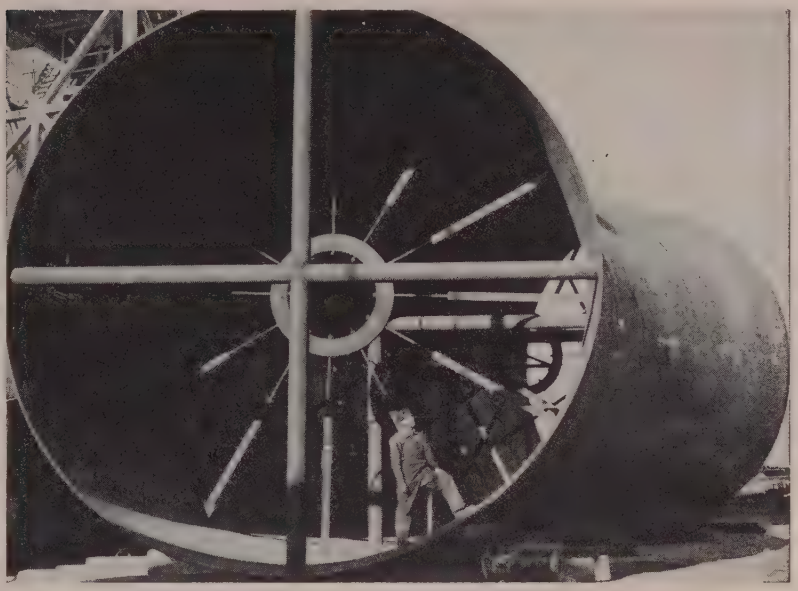
Announcement will be made later regarding officers of Federated Steel Co. in Georgia.

Magnesium Foundry Sold

General Credit Inc., Washington, sold its wholly owned subsidiary, General Magnesium Foundries Inc., Belleville, Ill., to Bremner Bros., Chicago. A. Burks Summers, president of General Credit, is executive vice president of General Magnesium Foundries Division of Bremner Bros.

New Aluminum Products Firm

Ohio Safety Ladder Co. signed a contract with the Barnesboro Industrial Association to take over a plant site in North Barnesboro, Pa., where it will manufacture aluminum products. The Ohio firm will become a Pennsylvania corporation to be known as Aluminum Products Inc. with a capital of $150,000.



Hydroelectric Project Requires Huge Elbows

This steel elbow, weighing 86 tons, was assembled at the South San Francisco plant of U. S. Steel Corp.'s Consolidated Western Steel Division to check measurements for 31 more to follow. They're for penstocks at the hydroelectric project at Chief Joseph dam on the Columbia river, Washington. Elbows are made of 1-inch plate and are 25 feet in diameter and 58 feet long

Newman-Crosby Expanding

Newman-Crosby Steel Co., producer of cold-rolled strip, Pawtucket, R. I., is building an addition to house a new annealing furnace to handle 10-ton heats.

Siebert Buys Machine Works

Leaming Machine Works, Avon, N. Y., was purchased by Raymond Siebert, chief engineer for Crescent Industries Inc., Park Ridge, Ill. The plant in Avon will continue to make precision parts.

Sales Offices Opened

Wolverine Tube Division, Calumet & Hecla Inc., Detroit, opened sales offices at 5 E. Long St., Columbus, O. James A. Jolly is in charge of this office.

Coke Oven Contract Awarded

National Tube Division, United States Steel Corp., Pittsburgh, awarded a contract to Wilputte Coke Oven Division, Allied Chemical & Dye Corp., New York, for the design and construction of a battery of 59 coke ovens for its plant at Lorain, O. Capacity of the ovens will be about 290,000 tons of coke per year. It will be metallurgical coke for use as blast furnace fuel.

A. S. & R. Appoints Agent

American Smelting & Refining Co., New York, appointed Troy Belting & Supply Co. Inc., Troy, N. Y., as a distributor for continuous-cast bronze products produced in its Perth Amboy plant, Barber, N. J.

Follansbee Moves Offices

Follansbee Steel Corp., is occupying new headquarters at 140 Stanwix St., Pittsburgh. It is the first time the firm has moved its general offices in nearly half a century.

Produces Light-Weight Pistol

An aluminum alloy revolver, weighing less than one pound, is shooting off the production line at Smith & Wesson Inc., Springfield, Mass. The pistol is primarily designed for law enforcement officers

for whom easy concealment, weight, size and power are important factors.

Associations Elect Officers

Newly-elected president of American Supply & Machinery Manufacturers Association is J. Robert Kelley, vice president and general manager, Shaw-Box Division, Manning, Maxwell & Moore Inc., Muskegon, Mich. He succeeds J. A. Proven, vice president, Porter-Cable Machine Co., Syracuse, N. Y. New first vice president is T. D. Vander Voort, vice president and treasurer, Clemson Bros. Inc., Middletown, N. Y.; second vice president is Clarence B. Noelting, executive vice president, Faultless Caster Corp., Evansville, Ind.; treasurer is Frank P. Green, vice president, Delta File Works Inc., Philadelphia.

President of National Industrial Distributors Association is T. Gordon Vaughan, W. M. Pattison Supply Co., Cleveland. Vice presidents are R. H. Barr, Reilly Bros. & Raub Inc., Lancaster, Pa.; C. E. Gollwitzer, Pratt-Gilbert Hardware Co., Phoenix, Ariz.; and Frank Cruger, Indiana Manufacturers Supply Co., Indianapolis.

Officers of Southern Industrial Distributors Association are: President, B. S. Barker, Pye-Barker Supply Co., Atlanta; first vice president, C. McDengland Jr., Logan Hardware & Supply Co., Logan, W. Va.; second vice president, Paul J. Stine, Henry P. Leu Inc., Orlando, Fla.

Machinery Firm Expands

Hartford Special Machinery Co., Hartford, Conn., is building an assembly plant adjacent to its warehouse at Simsbury, Conn.

Crane Maker Changes Name

Industrial Equipment Co., Chicago, changed its name to Industrial Crane & Hoist Corp. The company manufactures cranes, runways and hoists.

Boost Propeller Output

Curtiss-Wright Corp. is constructing a plant in Buffalo for the production of airplane propeller blades. The $2 million plant is part of the firm's $10 million expansion program in that area.

United Press

Steel Tubing Used in Coronation Artistry

Outline of a unicorn takes shape at the metalworks of C. Hall in London as artisans weld steel tubing into the form of the one-horned mythical animal. The figure is one of 16 lions and unicorns which will overlook the coronation procession from atop London's Mall. Each will be 17 feet in height

Stamco Names Representative

Stamco Inc., New Bremen, O., appointed Luther & Pedersen Inc., Chicago, as its exclusive representative in that territory on the firm's line of slitting and shearing equipment.

New Marketing Department

S. W. Wilkerson Associates, Philadelphia, established an industrial marketing department under the direction of Charles W. Moore. Mr. Moore is a former director of commercial research with SKF Industries Inc., that city.

New Shipping Lane Inaugurated

SS Carl Schmedeman has arrived in Corpus Christi bay, Texas, and becomes the first ocean-going vessel to pass through a seven-mile channel recently dredged through the bay to the dock of Reynolds Metals Co.'s La Quinta alumina plant. The *Schmedeman*, with her cargo of aluminum ore from Jamaica, provides the final link for the operation of the Reynolds aluminum-making installation. This was the first shipment of bauxite from Reynolds' Jamaica Mines Ltd. to the dock of the new alumina plant. Previously, vessels had unloaded the Jamaican ore at Mobile, Ala.

Joy Buys Engineering Firm

Joy Mfg. Co., Pittsburgh, acquired Barnes & Reinecke Inc., Chicago, an engineering firm specializing in mechanical research and development. The newly acquired firm will be operated under its present name as a subsidiary of Joy Mfg.

IRC Plant Opened

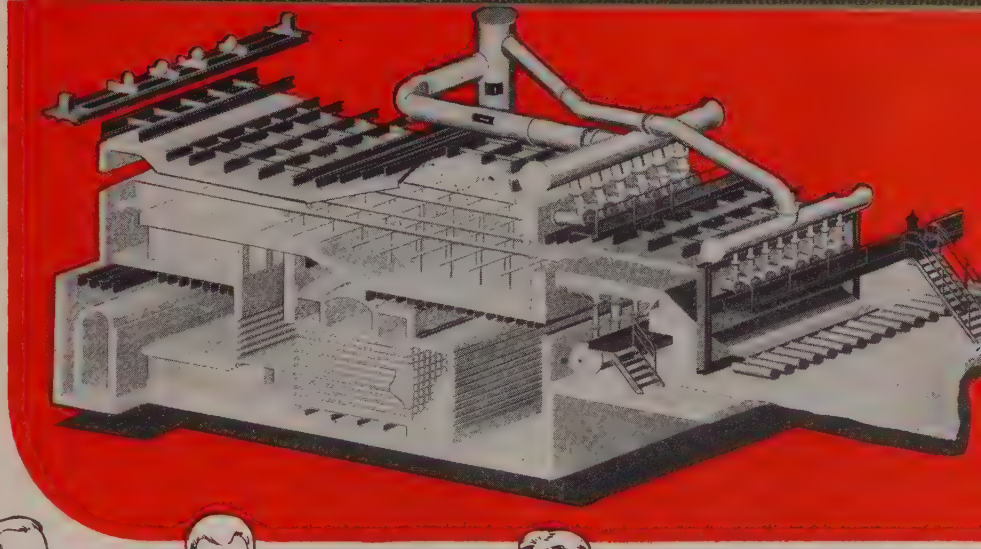
International Resistance Co., Philadelphia, has initiated production at its $200,000 plant in Asheville, N. C. The plant is turning out various types of volume controls used in radios, television sets, military equipment and numerous other devices.

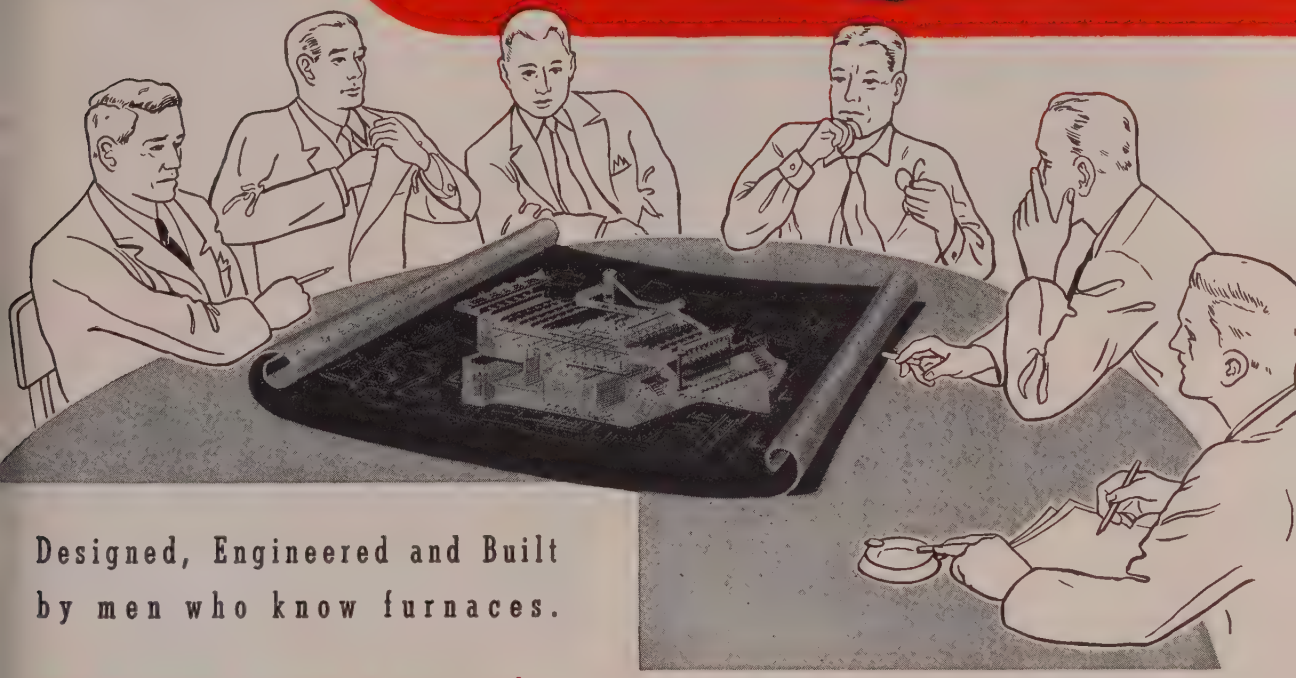
Chrysler Moves Department

Ordnance development department of Chrysler Corp.'s Engineering Division moved into new quarters at the Chrysler MoPar Parts

for better reheating

SLABS
BLOOMS
BILLETS
BARS, ETC.





Designed, Engineered and Built by men who know furnaces.

No Wonder Steel Men Prefer

RUST CONTINUOUS REHEATING FURNACES

for Accurate Temperature Control • High Capacity • Economy

Rust's patented zone-controlled, double or triple-fired, recuperative, continuous furnaces are individually designed to meet specific needs. Each furnace provides positive automatic control of predetermined heating temperature. Flexibility is achieved by simply changing the fuel firing rate in the heating zone. The result is high tonnage output with minimum fuel consumption. In addition to reheating furnaces, Rust builds other types (designed for any fuel) to meet practically all metallurgical heating needs. For either new or modernization projects rely on Rust for the complete job.

THE WHOLE JOB IS ONE JOB WITH A "RUST PACKAGE CONTRACT"

One contract covers everything . . . from blueprint through start-up. Rust assumes responsibility for design, manufacture, erection, and is prepared to undertake all phases of the work with its own forces, including wiring and piping. This results in substantial savings . . . One profit instead of pyramiding ones which accrue when many subcontractors are employed.

RUST FURNACE COMPANY

Pioneers in Furnace Design

RUST BUILDING PITTSBURGH, PA.

F-9

WHO EVER HEARD

of a supermarket

for *Steel!*

Whether you need large quantities of steel or just an occasional small amount, Builders Structural Steel Corporation is the right answer to your steel-buying problem.

The entire facilities of a veritable steel supermarket are at your service, with specialized departments for fabrication, erection, engineering, miscellaneous and ornamental steel. Builders knows steel because Builders works with steel... 24 hours a day! Year after year, hundreds of the nation's leading concerns depend on Builders for warehouse steel service. Telephone your inquiry today for prompt action!

***Immediate shipment!*— PLATES, SHEETS, STRIP, PIPE, BILLETS, STRUCTURALS, BARS, ALUMINUM, STRUCTOGLAS, RELIANCE Electro-Pressure Welded GRATING**

Builders Structural Steel Corp.

2912 EAST 34th STREET • CLEVELAND 15, OHIO • VUlcan 3-8300

Builders provides speedy *localized service* through arrangement with . . .
• THE ALLIED METALS CO., Niles, Ohio • FABRICATORS STEEL & MFG. CORP., New York City
• FABRICATORS STEEL CORP., Bladensburg, Maryland

plant, Centerline, Mich. James C. Zeder is vice president and director of engineering and research while C. C. Utz is chief ordnance engineer.

Shippers Elect Officers

Lake Carriers' Association, Cleveland, elected Oliver T. Burnham as vice president and secretary. Adm. Lyndon Spencer continues as president; F. J. Hollman, treasurer; Gilbert R. Johnson, counsel.

New directors are: L. F. Hammett, manager of operations, Pittsburgh Steamship Division, U. S. Steel Corp.; Gilbert W. Humphrey, vice president, M. A. Hanna Co.; W. F. Rapprich, assistant marine manager, Cleveland-Cliffs Iron Co.; Fred R. White Jr., vice president, Columbia Transportation Co.

Elected to the advisory committee are Mr. Humphrey and John J. Boland, president, American Steamship Co.

AEC Laboratory Opens

A new Atomic Energy Commission laboratory, located in Winchester, Mass., is in full operation. Primary objective of the laboratory, operated by American Cyanamid Co., New York, is the development and improvement of processes for the recovery of uranium from its ores.

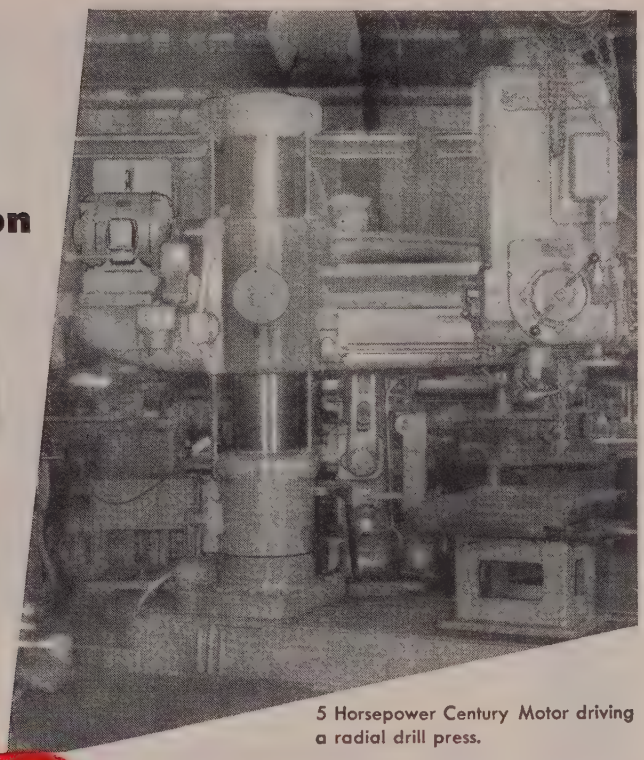
Lear To Move Headquarters

Lear Inc. will move its national headquarters from Grand Rapids, Mich., to Santa Monica, Calif., by June, 1953. The firm manufactures automatic pilots and other airborne electronic devices under the direction of George Otis, vice president and general manager.

Sales Representatives Named

Ar-Ka Engineering Inc., St. Louis, manufacturers representative, specializing in hydraulic and pneumatic applications, assigned Bill Brinkmeyer to handle accounts in north St. Louis city, St. Louis county and Illinois. Glenn Manley, formerly sales manager, Excelsior Machine & Tool Co., will cover south St. Louis city, St. Louis county, Illinois and Kentucky. Don Field is assigned St. Louis city desk duties.

On Your Production Machines . . .



5 Horsepower Century Motor driving a radial drill press.

Hold That Precision Line

With

Century Motors . . .

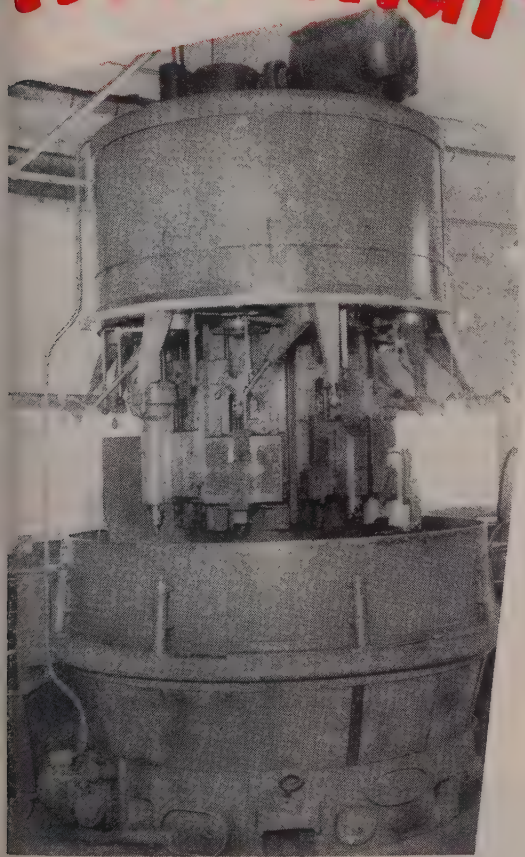
Widely Known for Their Unusual Freedom From Vibration

Century motors supplement the precision of fine equipment . . . resulting in closer tolerance of the product produced by the equipment.

The unusual freedom from vibration in Century motors is contributed by: Accurate concentric machining to provide a uniform magnetic airgap between the rotor and stator . . . Balanced electrical design . . . careful dynamic rotor balancing . . . accurately machined mounting surfaces.

Century offers a most complete line of types and sizes from ⅛ to 400 horsepower.

Specify Century motors on your original equipment. Call a Century branch office or a Century Distributor for your motor requirements.

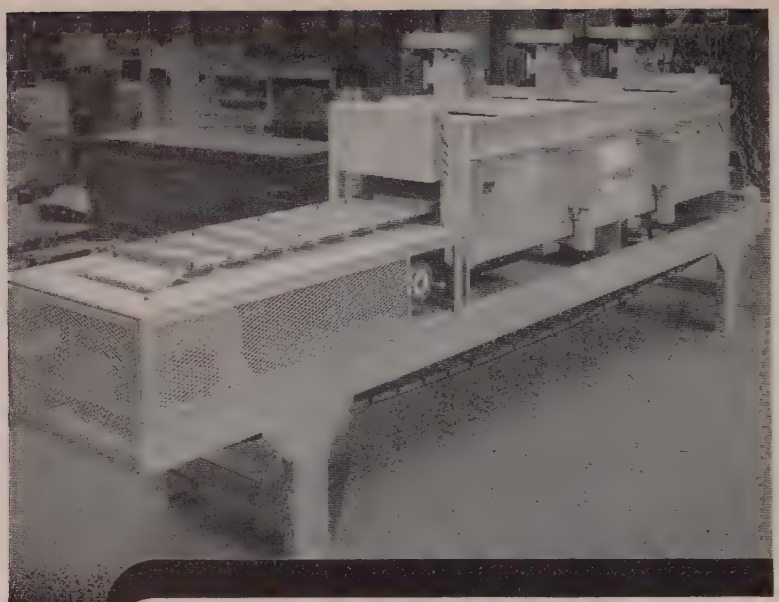


25 Horsepower Century Motor on a Bullard Automatic.

Century C Motors

CENTURY ELECTRIC COMPANY
1806 Pine Street
St. Louis 3, Missouri

CE-753



Specially Designed
for Continuous Production

HEVI DUTY®

CONVEYOR FURNACE

Of special design for Kohler Co. of Kohler, Wisconsin, this Hevi Duty Conveyor Furnace is being used to heat aluminum and brass billets prior to forging jet engine and other parts. Not only has this furnace been designed for a specific job, but Hevi Duty Engineers also built into this furnace many additional features.

- Notice the three fans which speed the heating of the billets by circulating the heated air, and also assure a uniform temperature in the heating chamber. With this feature, a smaller, more economical furnace is able to do this production job.
- Heat resistant alloy conveyor links and trays mean years of dependable service.
- Versatility . . . by using a variable speed drive to adjust the conveyor speed, this furnace can be used for annealing, tempering, and other heating operations.

Special Hevi Duty Furnaces can be engineered to your specifications and your production system. Let us know your requirements. Our engineers will work with you.

HEVI DUTY ELECTRIC COMPANY
MILWAUKEE 1, WISCONSIN
Heat Treating Furnaces... Electric Exclusively
Dry Type Transformers *Constant Current Regulators*

Ammo Line Speed-Up

Automatic conveyors and controls speed manufacture of steel artillery shell cases for the armed services on two highly mechanized production lines. A worker in the Chicago plant of Ekco Products Co. removes partially completed shell cases from a continuously moving overhead conveyor

Metaseal Plant Opened

American Metaseal Corp. opened a plant on E. Washington boulevard, Los Angeles, for application of its process of impregnation and treatment of porous metals. Operations are under the direction of George Harris.

Clearing Machine Agents

Harry P. Leu Inc., Orlando, Fla., was appointed to represent Clearing Machine Corp., Chicago, in the state of Florida. Shop Supply Co., Birmingham, will be the representative of this manufacturer of mechanical and hydraulic presses in Alabama and Mississippi.

Haffner Heads Association

J. B. Haffner, vice president and general manager, Bunker Hill & Sullivan Mining & Concentrating Co., Kellogg, Idaho, was elected president of Lead Industries Association, New York. He succeeds Felix E. Wormser, vice president, St. Joseph Lead Co., New York, who has been nominated to become assistant secretary of the interior for mineral resources. Vice presidents of the association are: K. C. Brownell, president, Ameri-

can Smelting & Refining Co.; J. A. Martino, president, National Lead Co.; J. M. Bowlby, chairman of the board, Eagle-Picher Co. R. L. Ziegfeld was reappointed secretary-treasurer.

Vanadium Corp. To Close Plant

Vanadium Corp. of America, New York, will soon terminate operations at its Bridgeville, Pa., plant. All operations will be transferred to a new plant at Cambridge, O., now near completion. The Cambridge plant will combine operations at the Bridgeville plant with those formerly carried out at a plant in Chester, Pa. which suspended operations. Production of aluminum alloys began at the new plant in November, 1952, and additional production units have gone into service since then as facilities became available.

Machine Tool Maker Builds

Fellows Gear Shaper Co., Springfield, Vt., plans construction of an addition to its plant in that city to be used for assembly of large machines.

Research Laboratory Opened

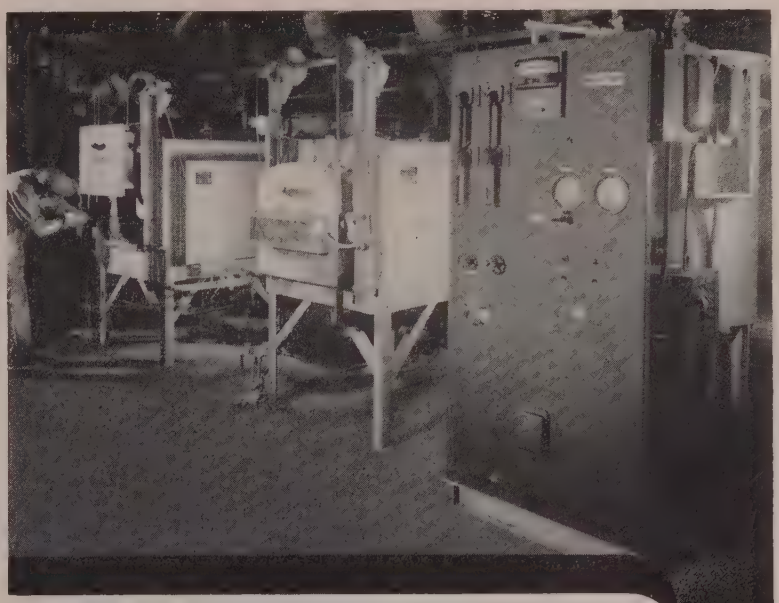
American Potash & Chemical Corp. moved to a new $300,000 chemical research laboratory at 201 W. Washington Blvd., Whittier, Calif. from 3030 W. Sixth St., Los Angeles.

Names Ohio Agent

Multi-Hydromatic Welding & Mfg. Co., East Detroit, Mich., named Robert E. Newton Co., Cleveland, as its representative in Ohio and western Pennsylvania.

Heads Warehouse Group

Frank B. Stewart, district manager in San Francisco for U. S. Steel Supply Division, U. S. Steel Corp., was elected president of the Northern California chapter of American Steel Warehouse Association. Other officers are: Paul Childs of Earle M. Jorgensen Co., vice president; Charles S. Conrad of Tay-Holbrook Inc., secretary; S. W. Sloneker of Hickinbotham Bros. Ltd., treasurer; Sidney Diehl



Tools and Dies
Heat Treated in...

HEVI DUTY® Controlled

ATMOSPHERE FURNACES

Allis-Chalmers of Milwaukee is using Hevi Duty Controlled Atmosphere Furnaces to heat treat tools and dies made from high carbon, high chrome steels, 18-4-1, molybdenum, and cobalt high speed steels. Maintaining the exact surface carbon content of the tools and dies during heat treating is achieved with —

- A Hevi Duty Endothermic Atmosphere Generator supplying 500 cubic feet per hour of prepared atmosphere. With this controlled atmosphere, troublesome scale and decarburization or carburization of the surface is eliminated.
- A Hevi Duty Box Type Hardening Furnace, designed for temperatures to 2000° F., is used for preheating high speed steels and hardening carbon steels.
- A Hevi Duty High Temperature Furnace, designed for temperatures to 2600° F., is used to harden the high speed steels.

This combination assures you that tools and dies can be treated to exact hardness. Achieve better heat treating results by specifying Hevi Duty Furnaces. Write for Bulletin 153.

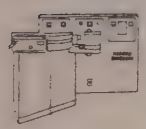
HEVI DUTY ELECTRIC COMPANY
MILWAUKEE 1, WISCONSIN
Heat Treating Furnaces... Electric Exclusively
Dry Type Transformers Constant Current Regulators

You Get Speed *and* Accuracy With ARL Production Control Quantometers

If you maintain quality control of materials by chemical analysis,

Here Are Facts That Will Amaze You!

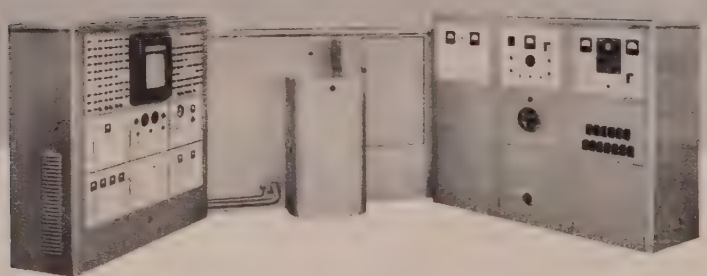
A Chemist averages 26 element determinations per day.



Spectrographic equipment raises his capacity to 150 element determinations per day.

ARL Production Control Quantometers* allow him to average 600 determinations per day . . . 23 times his output by chemical means.

This money-saving speed is important to you, but even more important— Is the Accuracy of the PCQ!



The PCQ offers accuracy equivalent to that obtained by routine chemical analysis.

Other advantages of the PCQ are: simplicity of operation to reduce human error to a minimum; analysis of 35 elements of your choice—up to 20 simultaneously; automatic inked record in duplicate of the concentration of elements present in alloys and inorganic compounds, in less than two minutes.

Mail the coupon today. An ARL field engineer will be glad to show you how to profitably apply the PCQ to your control problem.

*Trade Mark

Applied Research Laboratories
SPECTROCHEMICAL EQUIPMENT
3717 PARK PLACE GLENDALE 8, CALIFORNIA
NEW YORK • PITTSBURGH • DETROIT • CHICAGO • DALLAS • LOS ANGELES • LAUSANNE, Switzerland

Gentlemen: Please send me complete information on the ARL Production Control Quantometer.

Name _____ Company _____

Address _____

City _____ State _____

Wide World

Elevator Lifts Plane

During carrier qualification tests, platform-like elevator extending outside the ship's hull raises fighter from hangar deck to flight deck

---

of Foucar, Ray & Simon, chapter director.

Reynolds Expands Plant

Reynolds Metals Co.'s Plant No. 9 in Louisville, Ky., engaged in making aluminum foil from coil metal processed outside the state, will be altered to enable the plant to handle all steps in production of aluminum foil. This project, to cost about $2,553,000, will include modernization of the cast house where pig aluminum is melted and cast into billets suitable for rolling. New ovens and new "hot lines" for rolling the metal to thinner gages will be installed. The project will be started as soon as plans are completed.

Bullard Co. To Build

Bullard Co., machine tool manufacturer, Bridgeport, Conn., awarded contracts for an office addition and a new tool room. Cost of the project will approximate $600,000.

Dow Opens Sales Office

Dow Chemical Co., Midland, Mich., opened a sales office in Minneapolis to serve the markets in Minnesota, northern half of Wisconsin and the Dakotas. The Min-

everything in stainless... including the kitchen sink

Whether you require stainless steel in bars — round, square, flat or hexagonal... billets... sheets... plates... wire . . . or angles, there is a form of Crucible REZISTAL stainless that will fill your specific needs. And Crucible REZISTAL stainless steel is available in a wide assortment of grades, gauges and finishes to meet the diversified requirements of all industries.

Crucible's staff of metallurgists and stainless fabricating specialists are well experienced in solving application problems in the chemical, food processing, dairy, textile, laundry, hospital, pulp and paper and a host of other fields — including uses for Crucible REZISTAL in household articles like cutlery, cooking utensils and the proverbial *kitchen sink*.

If you have a specialized application where the unique qualities of stainless will improve your product or your processing operations, don't hesitate to call in a Crucible representative who can give you the benefit of our broad experience. And when you buy stainless, be sure you specify Crucible REZISTAL, the quality brand of heat and corrosion resistant steels.

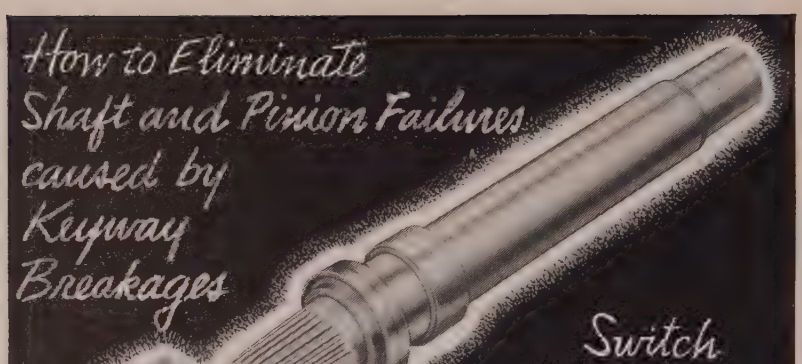
CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

STAINLESS STEEL

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

STAINLESS • REX HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS



33⅓% Increase in Life of Shafts and Pinions

Keyways weaken both shaft and pinion and frequently cause failures and work stoppages. But this can be eliminated by using PITTSBURGH Taper Serrated Shafts and Pinions which provide an all-around **V-lock** for great strength and endurance.

The male serrations on the shaft lock perfectly in the female serrations of the pinion. There is just enough taper so the pinion can be easily "shocked" on or off the shaft. One user reports no failure on more than 75 PITTSBURGH Taper Serrated Shafts and Pinions installed during a 4½ year period.

Genuine PITTSBURGH Taper Serrated Shafts and Pinions are available in many standard sizes, or made to your requirements.

Send your specifications today for prompt quotation.

SPUR

MITRE

HELICAL

HERRINGBONE

WORM GEARS

REDUCERS

CRANE WHEELS

ARMORED GEARS

Trademark Registered U. S. Patent Office

PITTSBURGH GEAR COMPANY

27th & Smallman Streets
Pittsburgh 22, Pa.
Phone: ATlantic 1-9950

subsidiary of BRAD FOOTE GEAR WORKS, INC. • CICERO 50, ILLINOIS

neapolis office will function as a branch of the Chicago office.

Leckenby Expands Facilities

Leckenby Structural Steel Co. Seattle, more than doubled its ca pacity for fabrication of structura steel and plates. The plant now has 20,000 sq ft of floor space and can turn out 400 to 450 tons of fabricated steel a month.

Heli-Coil Licenses Firm

Heli-Coil Corp., Danbury, Conn. manufacturer of screw thread in serts of stainless steel wire for in dustry, established the Resources & Facilities Corp. as exclusive licensee under Heli-Coil patents throughout the world, except the Western Hemisphere. Eugene M. Lang resigned as vice president of Heli-Coil Corp. to become president of the new firm which will maintain offices in New York, Washington, London, Paris and Tokyo.

Chemical Firm Expanding

First building of Dearborn Chemical Co.'s new plant in Lake Zurich Ill., is being constructed. Construction of this unit is part of the Chicago firm's long-range building and expansion program. The first unit is scheduled to go into production late this fall. It will be devoted to the manufacture of dry powdered products.

Northrop Building Addition

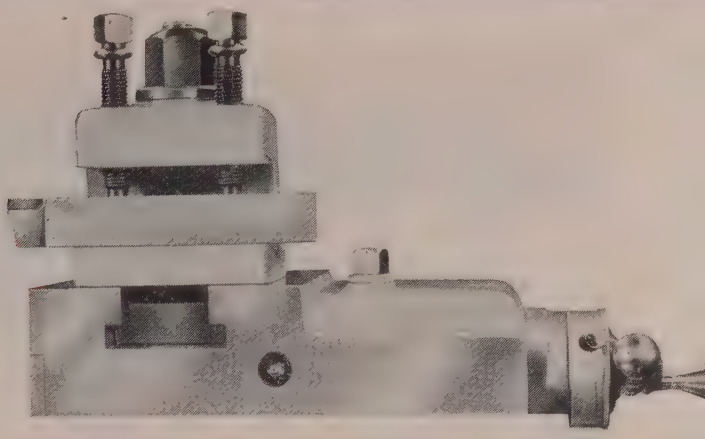
Northrop Aircraft Inc., Hawthorne, Calif., Anaheim Division will occupy soon a plant addition now being constructed for manufacture and assembly of precision tank optical units.

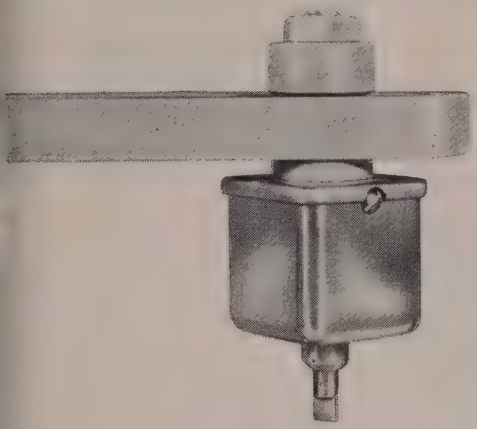
Conveyor Firm Names Dealers

Mar-Rail Conveyor Co., Pawtucket, R. I., appointed as dealers in their respective territories Gridley Equipment Co., Los Angeles; Llewellyn Machinery Corp Miami, Fla.; Wilkinson & McClea Ltd., Calgary, Alta.; Ensminge Co., Wilkes-Barre, Pa.; Dravo Doyle Co., Pittsburgh; Nixon Ma chinery & Supply Co., Chattanooga Tenn.; Superior Equipment Co Phoenix, Ariz.; Universal Scaffold

TOOL....

All the accuracy, rigidity and sensitivity built into Monarch lathes means optimum performance here.





...WITH ITS OWN NERVOUS SYSTEM...

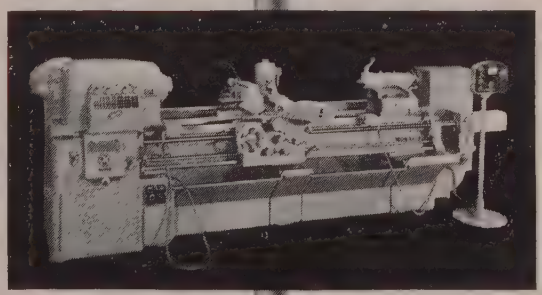
The Air-Gage Tracer is the most accurate lathe duplicating device yet developed. Change in template shape is converted to corresponding tool position change in a few thousandths of a second, tracer stylus operating on only 5 to 6 oz. pressure.

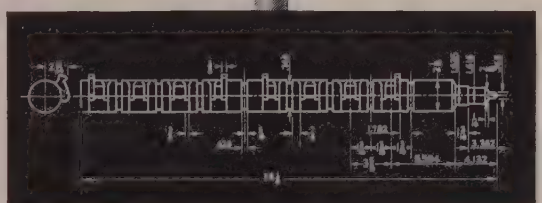
...AND BRAIN!.....

The Auto Cycle Unit is an *extra* push button control feature. Provides feed change as you need it . . . gives full automatic cycle operation . . . saves more time with fast traverse return.

Put all this together....

and you get the exclusive Monarch Air-Gage Tracer story in a nutshell. Higher output. Lower costs. Highest standards. Production at a profit. See typical job at right. Our Booklet #2606 gives many other examples, full details and specifications. Ask for it and see how tracer controls and Auto Cycle Unit can be applied to most Monarch Lathes. Write and indicate your interests . . . *The Monarch Machine Tool Company, Sidney, Ohio.*





FINGER LOCK BAR. *Material* — SAE 1045 forging. *Operations performed* — Turn complete. *Machine* — Series 60 Lathe with Auto Cycle Unit. *Total machining time* — 1 hour. *Time formerly required* — 4 hours.

Monarch
TURNING MACHINES

ACCURACY • ECONOMY • LONG LIFE

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

How CONE-DRIVE gears improve your equipment

You can be sure, if the equipment you purchased is operated through Cone-Drive gears or speed reducers, that the manufacturer is giving you "the best."

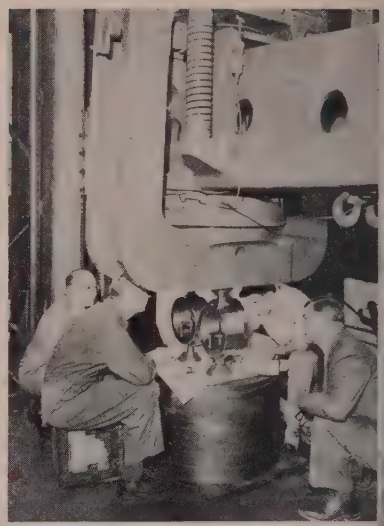
The secret of Cone-Drive gears and speed reducers is their double enveloping action. Double enveloping—the worm wrapped around the gear, the gear wrapped around the worm—means far greater load capacity for a given gear size, amazing smoothness, greater shock load capacity, far longer life expectancy and trouble-free operation.

Ask if the equipment you buy has double enveloping Cone-Drive gears or speed reducers if you, too, want "the best at the lowest cost."

Standard double-enveloping Cone-Drive gearsets and reducers have greater contact per tooth, more teeth in contact, increased load capacity, greater shock load capacity, longer life, lighter weight—and lower overall cost.

For information on use of Cone-Drive gears and reducers in your field, ask for Bulletin No 789-50.

CONE-DRIVE GEARS
Division, Michigan Tool Company
DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS
7171 E. McNichols Road • Detroit 12, Michigan



Testing Machine Examined
Engineers check a Baldwin one million-pound universal testing machine prior to installation in the Technical Center of National Malleable & Steel Castings Co., Cleveland

ing & Equipment Co., Denver; Star Machinery Co., Seattle; Howard F. Powell Co., Winnipeg, Man.; Reid & Halcomb Co. Inc., Indianapolis; Freestate Equipment Co. Inc., Baltimore; Clive-Thornton Inc., Philadelphia; Fletcher Equipment & Supplies Inc., New Orleans.

Air Reduction Grows

Air Reduction Co. plans to invest $100,000 in expansion of plant facilities and experiments with new production methods in the Buffalo area.

Standard Markets New Fastener

Standard Pressed Steel Co. Jenkintown, Pa., organized a new division to manufacture a new product, a self-locking, spring-pin fastener. The company set up the new division after buying the production machinery, inventory, patents pending and other assets of the Self Lock Fastener Corp. from the Rafter Machine Co., Belleville N. J.

The machinery was moved to the Jenkintown plant and set up in production area in a new part of the plant where a $10 million expansion program is nearing completion. James F. Regan, formerly vice president of the Self Lock Fastener Corp., is general manager of the new SPS division.

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: HOW *GRANODIZING* PROTECTS STEEL DRUM SURFACES FROM RUST AND IMPROVES PAINT ADHESION

NEW DEVELOPMENT IN CONTAINER INDUSTRY

United States Steel Products Division, United States Steel Company is now producing grease-free, scale-free, rust-inhibited steel drums. A chemically clean metal surface plus a "Granodine"* non-metallic zinc phosphate coating insures maximum finish durability and underpaint rust-resistance. *Trade Mark Reg. U.S. Pat. Off.

ORDINARY PAINTED DRUM after a year of exposure to weather is badly rusted. Rust was very apparent after only one week.

U. S. S. RUST-INHIBITED DRUM of similar type shows absolutely no rust after same year's test.

THE PROTECTIVE CHEMICAL TREATMENTS

The Granodizing process embodies the following steps:

1. Grease and dirt removal
2. Full scale removal, after welding the side seam
3. Zinc phosphate coating with "Granodine"
4. Acidulated rinsing in "Deoxylyte" solution

Port Arthur, Texas, Cleaning Line

U. S. S. drums about to enter the 400 foot cleaning and treating line. Powerful impingement sprays directed at the fabricated shell, head, and bottom, insure that the entire interior and exterior of the drum will receive full cleaning and rust-inhibiting treatment.

ADVANTAGES OF GRANODIZED STEEL DRUMS

These new phosphate-coated steel drums exhibit many advantages for companies using these containers.

They are chemically clean, "water-break free" inside, free of contaminating residues such as grease, oil, drawing and stamping compounds. When the familiar handkerchief test is applied to United States Steel Products' containers processed by their new finishing technique, no contamination of any kind is left on the cloth.

They are free of mill-scale. United States Steel Products is the first steel drum manufacturer to remove harmful mill scale completely ahead of the zinc phosphate coating stage.

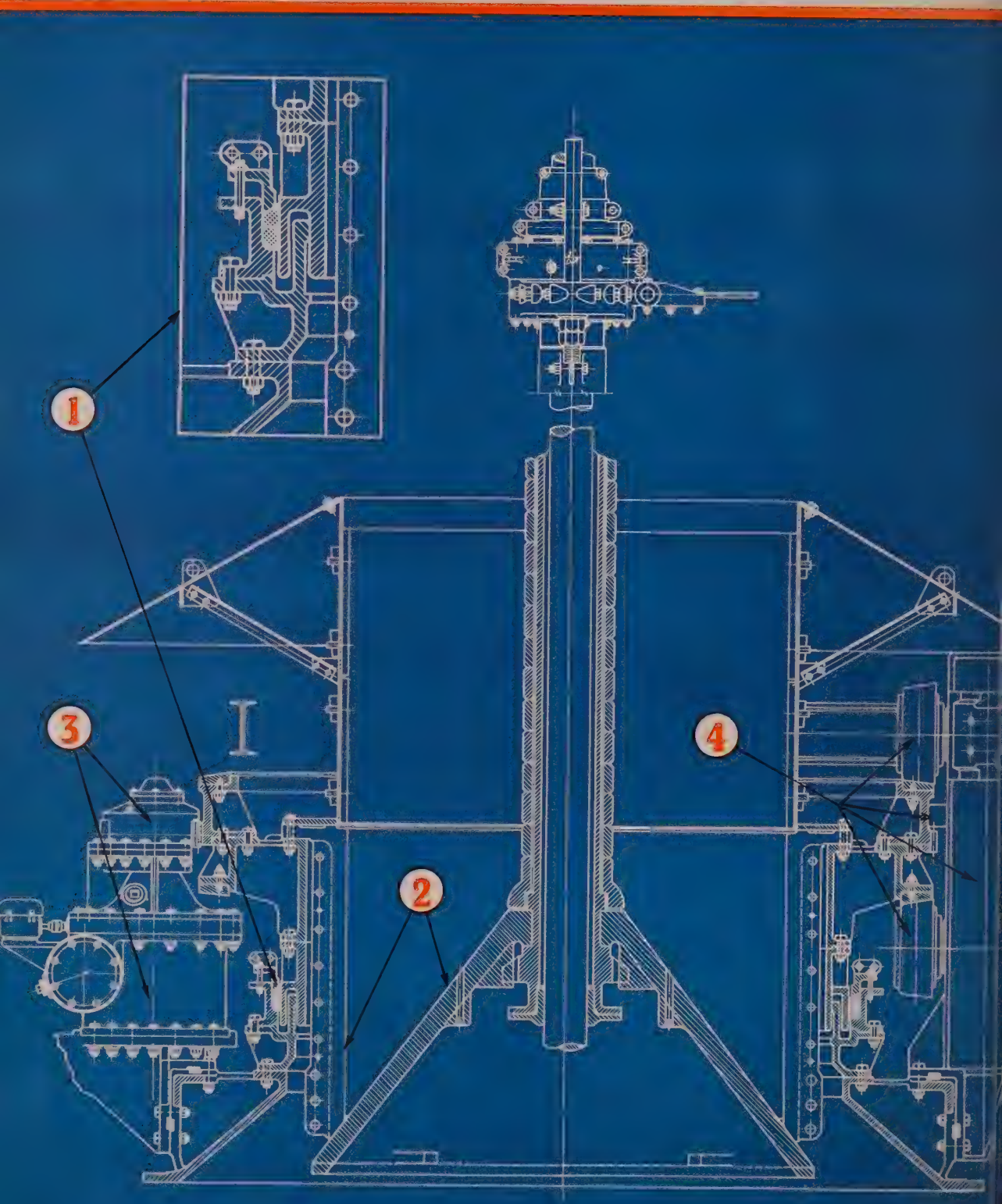
They are rust-inhibited with a zinc phosphate-coating. These new steel drums have the added advantage of a non-metallic, paint-bonding "Granodine" zinc phosphate coating. This has been standard practice for many years in the automotive and appliance industries for long-lasting paint protection and metal preservation.

CHEMICALS ACP PROCESSES

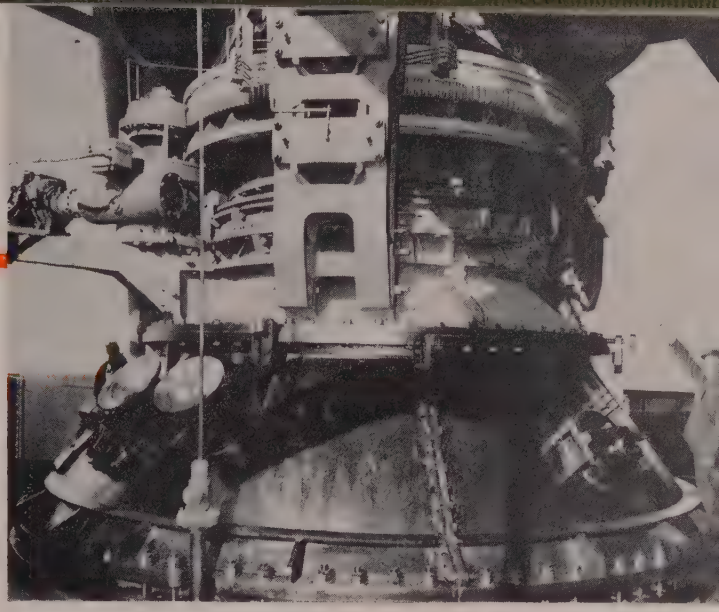
WRITE FOR INFORMATION ON "GRANODINE" AND ON YOUR OWN METAL PROTECTION PROBLEMS

CHEMICALS ACP PROCESSES

New McKee Patented, Heavy-Duty Bl



rnace Distributor



McKee is meeting the requirements of the modern, large hearth diameter furnaces and furnaces operating at high top pressures with this new heavy duty distributor of greater capacity and more massive construction.

The experience of almost half a century of design and construction of blast furnaces was applied in the development of this new McKee Distributor.

The mechanical dependability of its efficient design and rugged construction has been proved by uninterrupted, trouble-free performance under extreme operating conditions.

THESE EXCLUSIVE McKEE FEATURES REDUCE MAINTENANCE TIME AND COST, AND ASSURE LONGER UNINTERRUPTED PERFORMANCE UNDER BOTH NORMAL AND HIGH PRESSURE FURNACE OPERATION

1 New Triple Seal. This new seal consists of a grease labyrinth arranged to form a grease reservoir on the pressure side of a stuffing box which is equipped with an improved type of resilient packing. The labyrinth acts as a dirt stop ahead of the reservoir and packing. Excess grease added to the reservoir carries the dirt back into the furnace. Leakage into the packing is clean grease. The inner surface of the stuffing box is hard chrome plated for long life. The entire seal is completely independent of the bell seat and is arranged to be easily accessible for maintenance and gland adjustment.

2 Bell and Bell Seat are easily accessible for replacement by removing the revolving hopper only without disturbing ring gear, rollers or seal. The bell and bell seat are made of 12 to 14% manganese steel alloy castings of maximum practical thickness for long life.

3 Heavy-Duty Drive. The drive unit is designed for a twenty-five horse power driving motor which provides ample power and smooth operation under any extremes of furnace operation. An important feature of operation under dust-laden conditions is the use of dynamic braking which eliminates the need for mechanical brakes and brake maintenance.

4 Three Roller Stands. The top, bottom and side rollers are grouped in three vertical roller stands which have been designed to give maximum accessibility to the entire distributor unit. All parts are easily accessible for inspection and maintenance.

5 "Factor of Safety" Construction. An ample margin of safety is provided in the heavy construction of the McKee Distributor. Every part is designed to withstand far more than the maximum load to which it will be subjected. The Heavy-Duty Distributor weighs three times as much as the conventional type.

6 Wear Reduced at Every Point. Wider ring gear and pinion faces reduce wear by distributing loads over greater tooth length. Increased surfaces of rollers and roller track inserts distribute loads over larger areas. These features also maintain ring gear alignment and minimize horizontal movement.

7 Rugged Bearings. Heavy duty roller bearings of liberal size are used in top, bottom and side rollers, bell rod top and drive unit. All bearings are sealed against ingress of dirt.

8 Automatic Pressure Lubrication. Provision is made for the installation of a central lubrication system. While not normally provided with the Distributor it is recommended that an automatic lubrication system be used to assure proper lubrication at all points.

McKEE REVOLVING DISTRIBUTORS FOR SMALLER BLAST FURNACES

The standard McKee Distributor has been used throughout the Iron and Steel Industry for many years. It now incorporates many design features of the Heavy-Duty Distributor such as roller bearings, dynamic braking and heavy manganese alloy bell and seat. On some installations it is also practical to incorporate the new seal and easily accessible bell and seat design.

ENGINEERING, PURCHASING AND CONSTRUCTION FOR THE IRON AND STEEL AND PETROLEUM REFINING INDUSTRIES

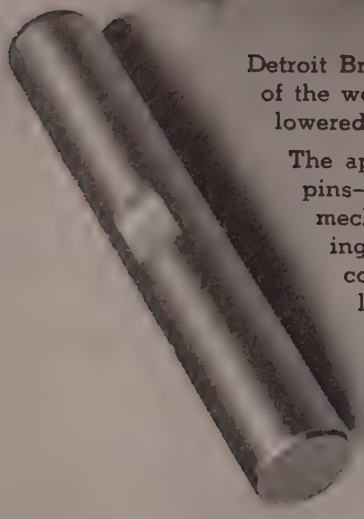
Arthur G. McKee & Company • Established 1905

Headquarters: McKee Building, 2300 Chester Avenue, Cleveland 1, Ohio.
Offices: New York • Tulsa, Oklahoma • Union, New Jersey • Washington, D. C.
British representatives of Metals Division: Head, Wrightson & Company, Ltd.
Canada: **Arthur G. McKee & Company of Canada, Ltd., 350 Bay St., Toronto 1, Ont.**

LOOK... *no hands!*

AUTOMATIC HANDLING *plus* CONTINUOUS BROACHING

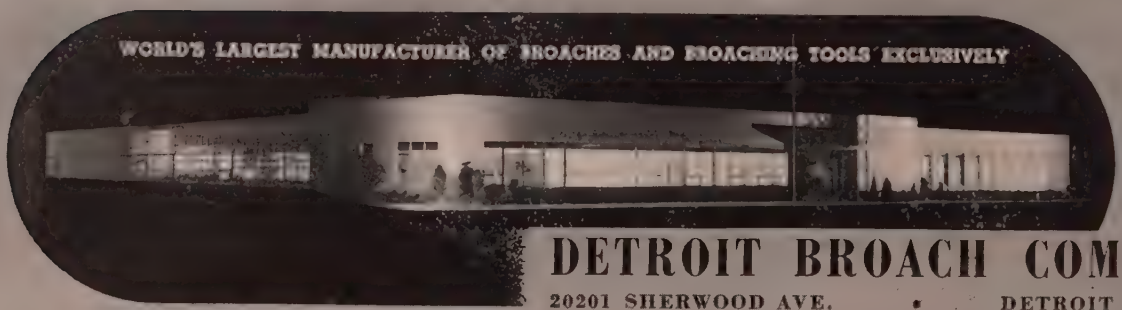
Combined to Increase Production 125%



Detroit Broach adds a new dimension in broaching economy . . . automatic handlir of the work. By eliminating manual loading, production ceilings are raised, costs a lowered and continuous efficiency is assured *independent of the human elemen*

The application above—facing the ends and producing a flat on automotive kir pins—illustrates typical benefits. Here, Detroit Broach applied a hopper and fe mechanism to a continuous broaching machine and thus eliminated manual loa ing of the parts. Precision tolerances are consistently held, production ru continuously and costs are at rock bottom. In this application the hoppe loaded manually, however, in many instances the hopper can be fed by co veyor from the previous operation.

On present or proposed broaching operations it will pay you to discu automation with Detroit Broach engineers. Chances are these broachi specialists will be able to come up with recommendations that will r sult in considerable savings for you. If you will just drop us a line, t nearest Detroit Broach representative will give you all the deta without obligation.



DETROIT BROACH COMPANY

20201 SHERWOOD AVE. • DETROIT 34, MICH

Production and Engineering
NEWS AT A GLANCE

TRANSISTORS' INFLUENCE—If at least part of the predictions about the influence of transistors on industrial processes come true, then this tiny electronic device will assume considerable importance. It may revolutionize the dry battery industry, says Walter A. Onorato, president, General Dry Batteries Inc., by providing new uses for batteries in electronic appliances where they haven't been applicable to date. The gains from new uses are expected to outweigh the loss of old types that may be eliminated. The transistor is expected to accentuate and speed up the trend toward smaller types of batteries operating at different voltages.

COMBINED PROCESSING—Operations including everything from preheating and annealing to brazing and hardening, with intermediate cooling and quenching of the work make the roller hearth well suited to many high production jobs. A producer of tank track subassemblies changed to this type of installation for brazing and heat treating plus cooling and quenching when production volume became too high for the method formerly used. p. 100

SPECIAL FORGING—Metallurgists at General Electric Co. reported at the Electrochemical Society meeting recently that they have designed and operated an apparatus so that metal remains in argon gas during an entire heating and forging operation. A furnace capable of operating to 2500°C is coupled to a 250-pound air hammer so that refractory alloys may be forged well above their recrystallization temperature. Tungsten and molybdenum alloys were forged at 2100°C and the surfaces did not oxidize.

LAW ENFORCEMENT—When Cross Co., Detroit, put some solenoids in oiltight compartments on their machines, it was to keep these control units from becoming contaminated. Experience showed, however, that in the field, the covers to the compartments were being removed and often left off. Solution, Cross mounted the solenoids on the covers. Now, no cover, no solenoid.

CHANGE SHOULDERS—Responsibility for the design and application of automation equipment should be transferred from the shoulders of the user to those of the machine builders. So said H. Rourke, general purchasing agent, Ford Motor Co., Detroit, in his address to the Machine Tool Distributors' Association at their meeting in Cincinnati recently. Pointing out what the large machine tool user expects from the machine tool industry in the next five years, Mr. Rourke cited the need for realistic information on prices, capacity and delivery. He hit the delivery issue hard, stressing the importance of avoiding any setbacks. Late delivery of one machine can delay the operation of many on an important line and can become a matter of great expense to the user. Since in peacetime about 40 per cent of the machine tool output goes to the auto industry, Mr. Rourke highlighted the need for continued co-operation between the automobile makers and the machine tool builders.

FLAWS ON TV—Immersed ultrasonic inspection equipment gives a good look at sub-surface defects. Cross section views of the interior of metals are portrayed on a 16-inch television type cathode ray tube by Electro-Circuits Inc.'s B-scan system. Flaws are portrayed in their true geometry, showing their length and depth below the surface. The distribution of inclusions and segregations within metal are shown on the television type screen. Flaws as near as ⅛-inch to the surface are readily displayed.

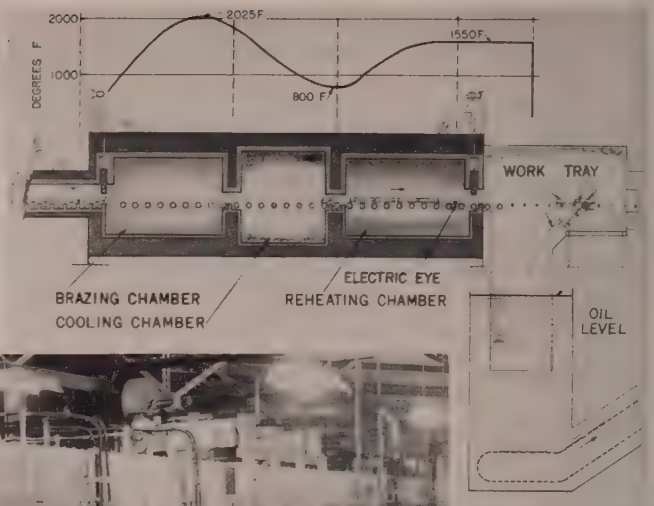
PICKLING NO PROBLEM—What to do with waste pickling liquors is an old and difficult problem for the steel industry. For many steelmakers there appeared a new ray of hope when Blaw-Knox announced the availability of a new process to recover the entire sulphate equivalent of waste pickle liquor as reusable sulphuric acid without producing other undesirable by-products. A flow sheet and explanation of how the process works provide interested steelmakers with helpful data. p. 130

ON THE RISE—M. W. Reece of Reichold Chemicals Corp. has recently called attention to the increasing use of protective coatings. The gallonage of protective coatings has grown from 280 million in 1936 to 600 million in 1951. In dollar terms, its sales have expanded during the same period from $444 million to $1181 million. New and improved resins are continually boosting the durability of film formers—the backbone of protective organic coatings.

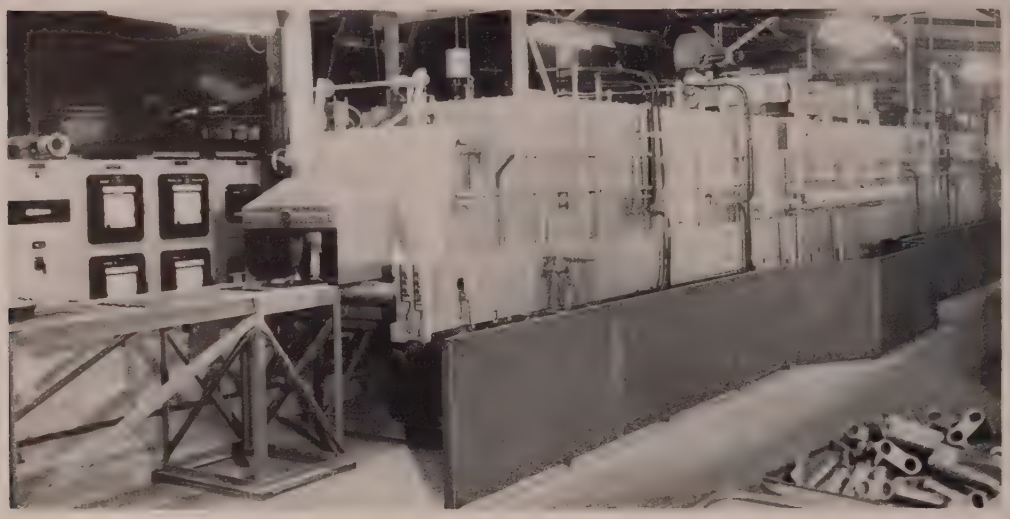
FOR TOUGH SURFACES—Fluoboric acid is finding increased use in many plants for pickling components containing metals that form insoluble compounds in sulphuric or hydrochloric acid. A. E. Carlson, General Chemical Co. told the Boston AES technical meeting, on April 18th, that the high solubility of all metal fluoborates makes fluoboric acid particularly useful in pickling soldered parts prior to nickel plating. The acid is also used for treating die castings. Another feature: Fluoboric acid treatment retards surface oxidation on parts that are pickled prior to soldering.

Metalworking Outlook—p. 39 *Market Outlook—p. 157*

Longitudinal section of roller-hearth furnace would look like this. Work temperatures follow curve at top. Partial cooling after brazing results in substantial savings in heat



Below — Typical combination roller-hearth furnace as viewed from charging end. Loaded trays move through the furnace at the rate of 16 per hour. Control instruments are shown at left



Roller Hearth Furnaces Toughen Tank Feet

Steel tank tracks get brazed and hardened as they move through automatic furnaces. The versatility and high output promise good future for this conveyorized system

By H. M. WEBBER
Industrial Heating Department
General Electric Co.
Schenectady, N. Y.

ABILITY to automatically provide several treatments in a single pass promises a good future for the roller hearth conveyor-type furnace. Typical combinations of operations include everything from preheating and annealing to brazing and hardening, with intermediate cooling and quenching of the work. These and other combined treatments are proving themselves successful in a wide variety of volume production applications.

Of special interest at the moment are a number of furnace installations involving the copper brazing, partial cooling, reheating and oil quenching of tank track bodies and tank track shoes. One large contractor for these items is Burgess Norton Mfg. Co., Geneva, Ill., which not only has several furnaces in its own plant but also numerous installations in subcontractors' plants.

Volume Production — Originally the tank track subassemblies were copper brazed and heat treated in separate batch-type electric furnaces. Production became so great, however, that it was necessary to resort to the continuous controlled atmosphere furnaces in order to minimize handling as much as possible. A battery of six such furnaces is shown in the accompanying photographs.

Trayloads of assemblies pass automatically into an entrance vestibule through a normally-closed end door, with the aid of a motor driven run-in mechanism, a motor-operated door mechanism and an electric eye and timer control. Twelve to 16 trays per hour enter intermittently in this manner; once in the vestibule they travel in a continuous train throughout the equipment.

Brazing First — In the brazing chamber the work reaches about 2025° F. It then moves slowly through a cooling chamber where it is lowered to 800-850° F for transformation below the critical temperature of the steel. Then in the reheating chamber, the work is

raised to about 1550° F and soaked preparatory to quenching for hardening.

As a tray intercepts the beam of an electric eye near the discharge door, the motor-operated door is raised and a runout mechanism quickly transfers the tray onto a hinged table in the adjoining quenching chamber. The table then tilts and allows the work to slide off the tray and into the oil, where it is picked up by a discharge conveyor in the bottom of the quench tank.

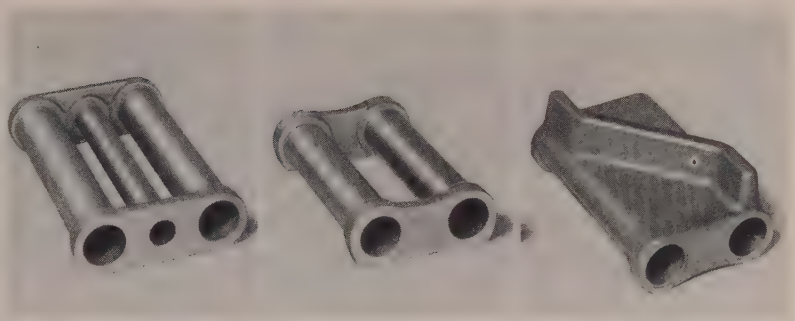
The work is then conveyed to a point above the floor level where the brazed and heat-treated assemblies, bright and clean, are picked off the conveyor by an operator who visually inspects and places them in tote boxes. Drawing takes place later in cylindrical pit-type furnaces.

All Automatic—After tilting, the hinged table which drops parts into the quench tank returns to the horizontal position, and the tray passes out through a water-jacketed cooling chamber. Trays are subsequently returned to the charging end of the furnace where they are reloaded and started through again.

Automaticity of the operation affords an important economic advantage in that intermediate handling of the work between the brazing and heat treating is eliminated. Another important point is the minimizing of heat absorption of the materials. Trays and work are only partially cooled after brazing, thus they retain about half the heat required for the hardening treatment.

A high ratio of net to gross weight, with relatively heavy work and lightweight trays, is also favorable. Trays, rolls and heating units have long life, resulting in low maintenance cost with good continuity of service. Protective atmosphere is rich exothermic gas, the lowest-cost atmosphere gas available.

Vital Statistics—Each of the furnaces described is rated 409 kw. Brazing chamber has 239 kw divided into two zones in the length, and the reheating chamber 170 kw in three zones. Door opening is 28 x 7 inches. Length of the brazing chamber is 13 feet, partial cooling chamber 12 feet, reheating chamber 5 feet and the water-jacketed cooling chamber 12 feet.



Closeup of two types of track bodies (called binoculars) and a track shoe show copper coating on surface after metal has penetrated sleeve joints

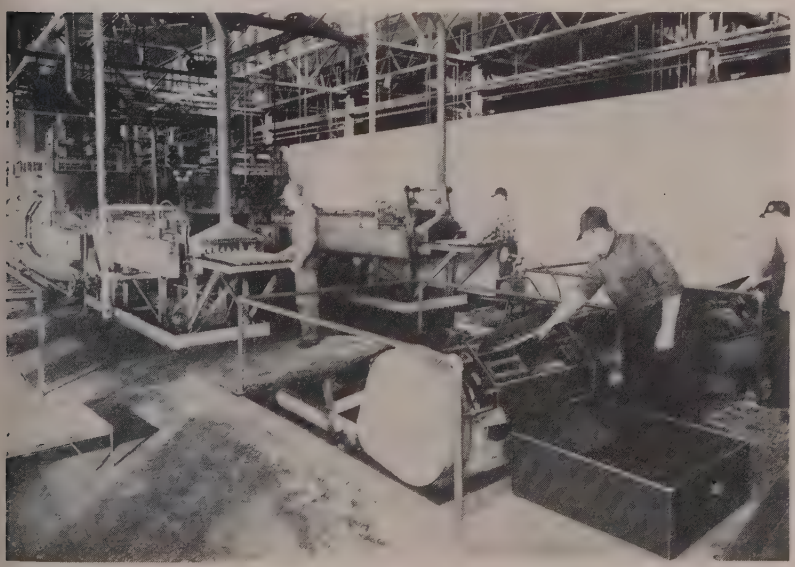
The tank parts being brazed and heat treated fall into two general classifications. One type is the tank track body, commonly called a "binocular" or track link. The other type is the steel track shoe which gets an induction hardening operation on its wearing surface after the drawing operation.

Preparing Assemblies — Before furnace brazing the tubes are centerless ground, and holes in the forgings are broached with final sizes being such that there is a press fit in all of the sleeve type joints. On the binoculars it has been the practice to apply a copper ring made of 0.047-inch wire on the top side at each joint of the assembly prior to its entrance into the furnace.

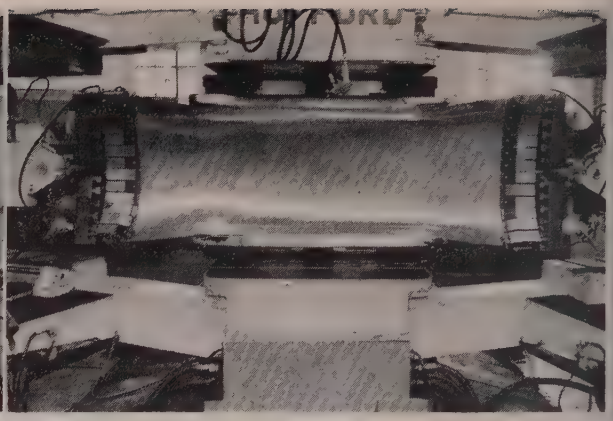
A bit of copper-powder paste is usually applied to start the wetting action and help assure drawing the molten copper wire into the joints.

When the binoculars are brazed, twelve assemblies are loaded on a tray about 24 x 30 inches in area. Thus the loading is 66 pounds net on a 25 pound tray, or a gross weight of 91 pounds. Production rate maintained is 1456 gross pounds per hour.

Similarly, steel track shoes are loaded about nine per tray with 99 pounds net on a 25 pound tray. On this basis, production rates of the assemblies are 192 binoculars or 108 steel track shoes per hour per furnace.



Discharge end of combination furnaces show operators removing brazed and heat-treated tank track bodies from the quench tank conveyors at right



Metal saving advantage of the curved jaws is easily seen in these two photos. Note the greater metal area between die and straight jaw to allow for transition from straight to curved surface. The curved jaws take a 44 per cent smaller blank sheet to begin with and premature breakage of the part has been eliminated

New Wrinkle in Stretch Wrap Forming

Segmented jaws can be curved to almost any desired preset contour to match transverse curvature of the form die. Advantages include widening range of stretchable metal

By M. J. CONNINGTON and W. F. THURBER
North American Aviation Inc.
Los Angeles

STRETCH WRAP forming, itself a comparatively new metalworking process, takes on added significance with the development of curved jaws for gripping the metal sheet. Originated by North American Aviation, Los Angeles, the idea has been licensed to Hufford Machine Works Inc., Redondo Beach, Calif.

This new type jaw receives the flat blank sheet and curves it automatically to match the transverse curvature of the form die prior to stretching. Made in a series of 11 individual segments, it may be curved to the desired preset contour by individual hydraulic cylinders integral with the jaw housing.

Saves Metal—The curved jaw eliminates the excessive material waste previously generated by the need for larger blanks to provide the extra material needed to effect a gradual transition from the curved die surface to the straight jaw. More uniform stretching and elimination of premature breakage of the parts have resulted. Strains on the edge surfaces of the material in the free area between the die radius and the jaws have been lessened.

In forming a typical saddle-back shape on a sheet metal stretch press a fixed form block platen is used and conventional movable straight jaws are attached to two hydraulic tension cylinders mounted on a 90 degree arc simultaneously or independently, as may be required when forming parts of nonsymmetrical configurations. Size of the material blank using straight jaws is 48 x 144 inches. The blank size, using curved jaws for the same part, is 40 x 96 inches, a saving of 3072 sq in. per part or 44 per cent. Extra material for straight jaw stretching is required between the jaw and the die to allow for a gradual transition from the curved die to the flat jaw.

Other Benefits — In addition to material savings, other benefits equally important have accrued. Use of straight jaws in some parts necessitated an additional rehit in a drop hammer die to complete the forming of the part in the reversed areas. With curved jaws, the same part was completely formed in one operation thereby eliminating a sizing operation and an additional tool.

The new jaw development has widened the range of materials applicable to stretch forming to include high strength aluminum alloys such as 75ST6 in the full hard temper. Heretofore these were considered impossible to stretch form because of limited stretchability characteristics of alloys with low elongation values and narrow forming ranges. The forming range in stretch forming constitutes the spread between yield and ultimate strength.

Formed in T Condition — Even

though the per cent of design stretch of nearly all the stretch formed sheet metal shapes is well within the total elongation of 75ST6, stretch forming in that temper has been regarded as impractical because the elongation limits of the material are exceeded in initial areas of the parts before complete forming is achieved. In nearly all cases, failures occur in the portion of the sheet positioned immediately adjacent to the straight jaws.

With the curved jaws 95 per cent of the current parts are being formed in the T condition as received from the mills. This eliminates heat treatment plus a subsequent aging operation; and, at the same time it effects reductions in manufacturing time spreads. Recent tests have shown that by using material in the full hard or T temper, the tendency of the part to buckle longitudinally is greatly reduced.

Die Friction—During the stretch forming cycle, in most cases, the entire sheet has the same physical properties. The material between the gripper jaw and the die will stretch the same as the material being formed on the die if no other variables are present. The most common interfering factor is die friction, another being variation in metal thickness.

Die friction is the force acting between the die and the part being formed, restricting stretch in certain areas of the part. In many cases it plays a very important part in forming parts of a severe configuration by not allowing the material to stretch at the crown of the part. By retarding the stretch in this area, the remaining area of the part may be stretched to equal the amount of stretch at the crown.

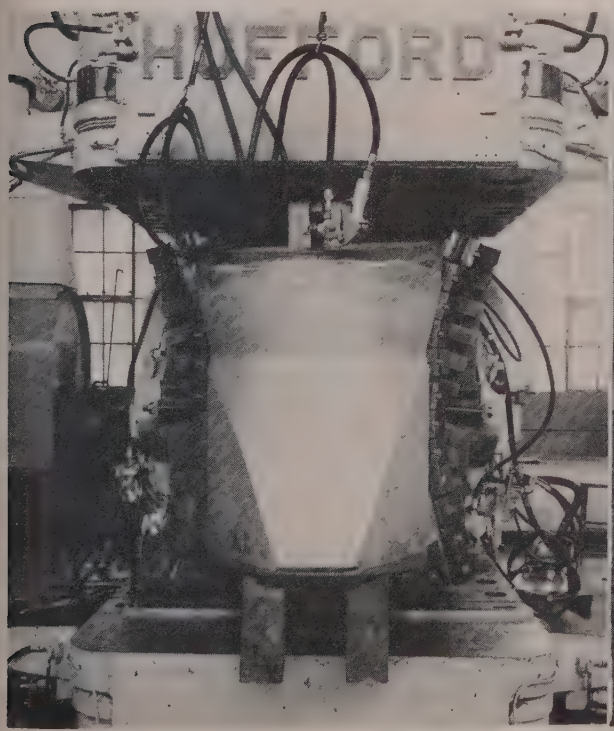
Physical Properties Rise—When the material on the die surface has built up sufficient physical properties, it no longer stretches, but the stretching action immediately transfers to the free area between jaws and die and stretches there until the physical properties in that area build up equal to the physical properties of the portion of the sheet on the die.

In most cases, if the sheet fractures it will occur in the free area due to necking, (reduction of the cross-sectional area of the sheet), in the area adjacent to the jaw, the reason being that no external friction is acting on the material between the jaws and the die to retard necking.

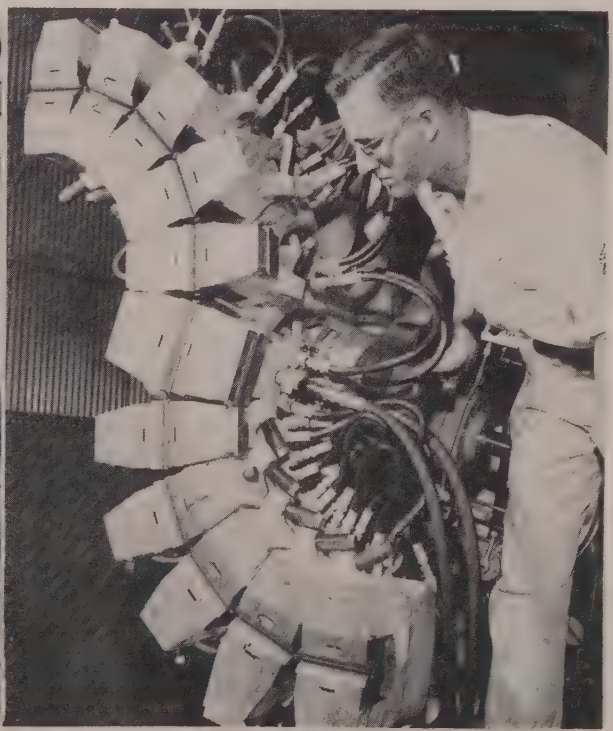
Laboratory Tests—In order to accurately determine what effect stretch forming has on the material being formed, gridded specimens of material are often formed on dies during normal production runs.

These metal specimens are then sent to the laboratory for testing, whereby various portions of the sheet are subjected to tensile testing, bend testing, etc.

In summary, results of these tests have shown that stretch wrap forming even over severe contours where high elongation occurs does not damage the material. In general, the cold work of the material during stretch wrap forming increases the yield strength considderably, but has little effect on ultimate strength. Reduction in gage thickness is usually negligible, and in most cases is within the original thickness tolerance.



Corrosion resistant sheet steel is stretched to shape in one operation. No drop hammer rehit is necessary



Hydraulically operated jaw receives the blank sheet and curves it automatically to match the form die

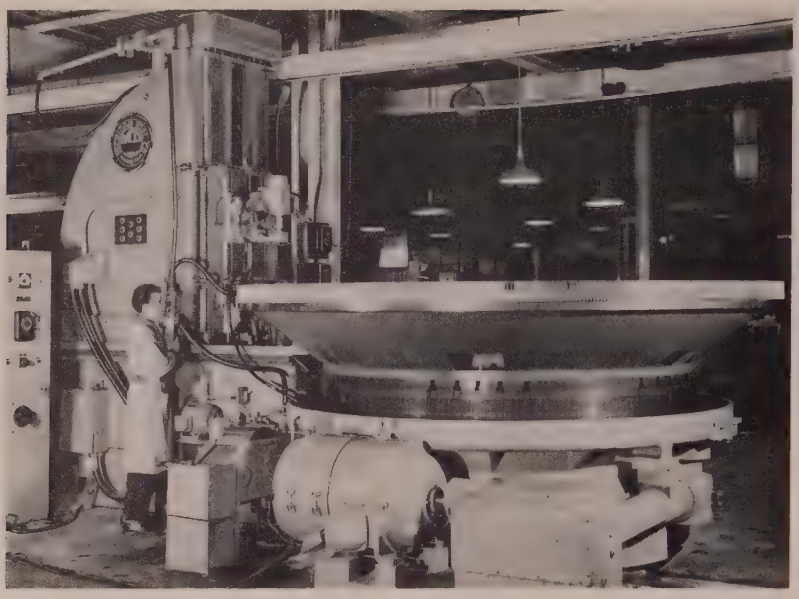


Table drive gear for the 180-inch machine being shaved on the V-120. Drive unit for the table is in the foreground. Table runout is held to 0.0003-inch

Big Gears Get Quick Shave

Precision finishing of gears up to 15 feet in diameter can be handled by new line of shavers. Time savings and cost reduction are big gains

GEAR SHAVING on diameters up to 15 feet can now be accomplished on a new line of machines. Largest of the line has a table which will accommodate a 180-inch diameter gear.

Line of standard vertical large gear shaving machines is announced by Michigan Tool Co., Detroit, and is called the V-series. Four standard models are the 48, 72, 120 and the 180-inch machines. Size denotes the gear-diameter capacities.

Quick Check—Machines are designed for high versatility and are provided with facilities for mounting of integral gear-checking accessories. This makes it possible to check gears before removal from the finishing machine. Principal application of the machines will be for gears used in marine, railroad, power plant and ordnance.

Largest of the four big gear shavers, the V-180, accommodates internal or external gears from 100 to 180 inches in diameter. Spur, helical and gears with or without integral shafts are finished on the machine. The table is provided with a 36-inch diameter hole to take a shaft when necessary. Machine has a capacity for shaving spur, helical and herringbone gears 65 inches wide.

Two for One—All models except the V-48 are available with dual cutting heads. Two heads adjust independently for correct angle, and the top head may be adjusted for height. Use of two cutters materially decreases cutting time. With a herringbone gear each cutter cuts one helix face so that both helices may be finished at the same time.

Large tables are set on a cast iron base. The vertical slide is on a large heavy casting which is set on a base casting. Design permits complete rigidity.

Film Support—Head of the machine can be tilted forward or backward. This enables the tooth surface to be deliberately tapered to provide total face-width contact under deflection conditions which often result from the heavy loads transmitted by the gears in service.

Tables on the three larger models of the V-series machines are supported by an oil film. Pressure of this film can be adjusted to suit varying table loads. Table actually revolves on the metal bushing, but by accurate control of the hydraulic pressure, the oil can support almost all of the load thereby reducing machine wear.

Gage Leveled — Maintenance of an accuracy to 0.0003-inch in leveling entire machine is achieved through the use of a strain gage which checks and keeps uniform the strain on each leveling jack. Thus the original assembly setup can be duplicated at the user's plant and maintained continuously thereafter. This provides for exact weight distribution and elimination of stresses which might be set up by uneven weight distribution.

Considerable cost reduction anticipated in the use of the big shavers stems from the fact that gears can be finished by the shaving process in a fraction of the time that it ordinarily takes.

Time required by other methods frequently runs into hundreds of hours per set of gears. It is often also necessary to use a single-thread hob for the fine finished form required.

Faster Hobbing — With shaved gears it is possible to use multiple thread hobs for roughing and semi-finishing the gears. This leads to a substantial reduction in hobbing time. In addition it is not necessary to maintain as close a control over the accuracy of gears as they come from the hobbing machine, since even errors in helix angles can be corrected by shaving.

Other advantages cited by the manufacturer are the more accurate control of the true involute forms especially at the pitch line; ability to incorporate and control tip relief in the tooth form of the gear tooth and ability to finish the gear tooth surface to as fine as 12 micro-inches.

Why you can *lower inspection costs*

with a Kodak Conju-Gage Gear Checker

Why the composite check

The composite check recommended in American Standard B6.11-1951 tests gears functionally by running the gear against a master of known accuracy. The resulting displacement shows at once the cumulative effect of as many as six types of error—eliminates time-consuming checks for each individual error. The check is rapid and conclusive.

Why the Kodak Conju-Gage Gear Checker

To meet today's tolerance requirements, the Kodak Conju-Gage Gear Checker uses a master made with a new order of precision. This is the Kodak Conju-Gage Worm Section, produced by thread grinding under control of a precision lead screw.

The accuracy inherent in this method means every right gear is passed by the worm section, reducing rejection losses. The transverse curvature produced by this method provides a master that can be used to check any gear of like pitch and pressure angle, regardless of helix.

Not only can a single worm section be used in place of a number of circular masters, but such a worm section can be reground to specification as often as necessary—at a fraction of replacement cost. It is easily checked for accuracy by familiar toolroom procedures.

You can find out more about the economies possible through Kodak Conju-Gage Instrumentation by sending for a copy of the booklet, "Kodak Conju-Gage Gear Testing Principle." Write to:

Industrial Optical Division
EASTMAN KODAK COMPANY
Rochester 4, N. Y.

The Kodak Conju-Gage Gear Checker automatically records the composite effects of runout, base pitch error, tooth thickness variations, profile error, lead error, and lateral runout. Illustrated is the Kodak Conju-Gage Gear Checker, Model 4U, for gears up to 4⅛" pitch diameter. Larger and smaller models are also available.

CONJU-GAGE INSTRUMENTATION

... a new way to check gear precision in action

To inspect all kinds of complex parts on a bright screen, Kodak also makes two highly versatile contour projectors.

Kodak
TRADE-MARK

Mass production for 81 mm mortar and 105 mm artillery shells makes liberal use of conveyors for moving parts in process through line

Extrusion Goes Commercial

Extruded steel shapes for the military are getting ready to go civilian. Added facilities increase the product range

A FEW YEARS ago there was plenty of speculation about cold extrusion but there was little manufacturing experience. Many press operators felt that shellmaking was a natural avenue for the process but talk about possible commercial applications was at best premature.

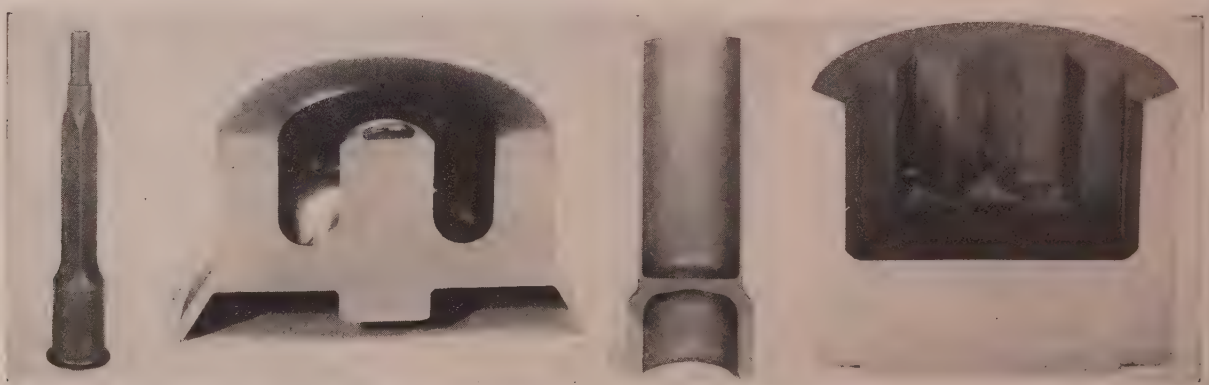
At least one company felt the process had its place in metalworking and set about developing techniques for acquiring the dies, equipment and know-how needed to produce a variety of commercial shapes.

At the same time the Mullins Mfg. Co., Warren, O., set up lines to mass produce 81 mm mortar and 105 mm artillery shells. Along military lines more than 2.5 million shells have been produced with machining requirements being limited to threading and placing the rotating band on the 105 mm. Costwise, production of shells by this technique is well below the national average.

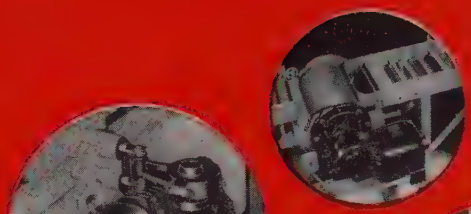
Wide Range—Commercially the Mullins Koldflo process isn't limited to production of straight-walled cylinders as shown in the accompanying illustrations. Such forms as integral studs, offsets of several types and combinations, multiple flanges, lands or flutes, integral webs or separators are being made. As with the shell production, machining is kept to a minimum and in many instances is limited to threading. Surface finish is good with about a 60-microinch finish readily available and finishes down to about 10 microinches possible when required by the particular job.

Sample jobs run to date demonstrate commercial feasibility of the Koldflo process. Bids are submitted on a fixed cost basis without additional development fees. Jobs undertaken to date are being produced at lower cost than by former methods, demonstrating that the process isn't limited to military work where need rather than price is the determining factor.

Getting Ready — Construction is underway at Mullins' Warren plant to set up a line for commer-



Typical commercial parts produced by Koldflo process. Dies are used to form all shapes including combinations of rounds and squares. Integral webs or separators can be located any place within tube and made leakproof



On big jobs or little ones it pays to take advantage of Master's unusual ability to supply the RIGHT horsepower, the RIGHT shaft speed, the RIGHT construction features, the RIGHT mounting . . . all combined into one compact power package.

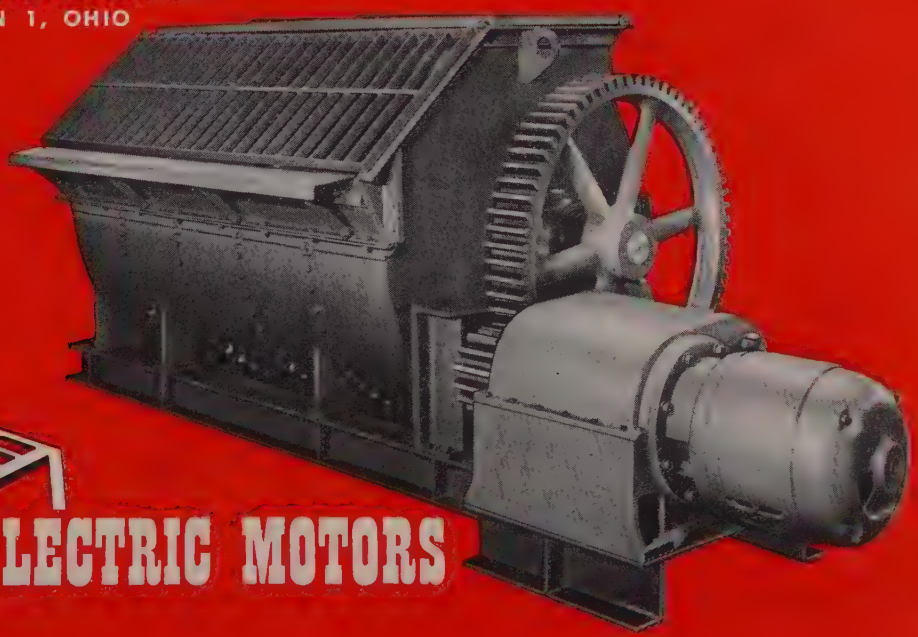
Don't put up with make-shift assemblies when you too may be enjoying these advantages. Master Motors, available in thousands and thousands of types and ratings (up to 200 HP) give you a selection you can get nowhere else.

Open, enclosed, splash proof, fan-cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 432 to 1 ratio . . . with electric brakes . . . with mechanical variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best motor drive for YOU.

little ones or BIG ones

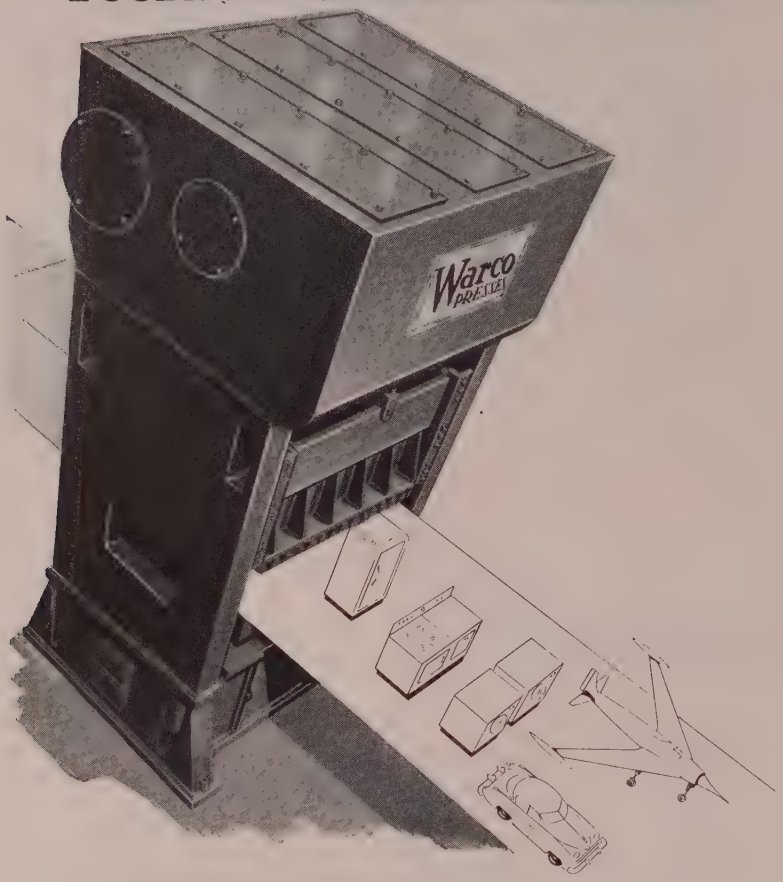
Select the RIGHT power drive from Master's broad line and you can increase the saleability of your motor driven products . . . improve the economy and productivity of your plant equipment.

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO



MASTER
ELECTRIC MOTORS

WHY THE DEMAND IS UP FOR WARCO ECCENTRIC GEAR PRESSES



For fabricators of metal stampings requiring dependable, long-life equipment for jobs involving speeds of 25 to 30 strokes per minute, and where work is to be done high up on the stroke (i.e. production runs of deep-drawn parts), Warco offers an advanced line of single-point, two-point, and four-point Eccentric Gear Presses.

From the four-piece welded steel frame to the steel gears and heat-treated pinions, Warco Presses are designed to give maximum performance. They incorporate such advantages as welded steel slides with barrel-type adjustment, and air counterbalance — Warco's popular pneumatic friction clutch and brake unit with simplified push button controls — and many other features that enable Warco Presses to deliver at peak production with utmost safety — features that are constantly increasing the demand for Warco Eccentric Gear Presses.

Federal® WELDERS

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO

Warco PRESSES®

cial work. Four Lake Erie long-stroke 3000-ton presses are no order with the first due to arrive next month. Foundations are completed and steel work is about ready to go up on a new structure to house heat treating equipment and a tool room adjacent to the main plant. Two 2000-ton presses are already in the plant and will be part of the extrusion line. Pieces of steel weighing up to 100 pounds will be shaped at room temperatures when the line is completed.

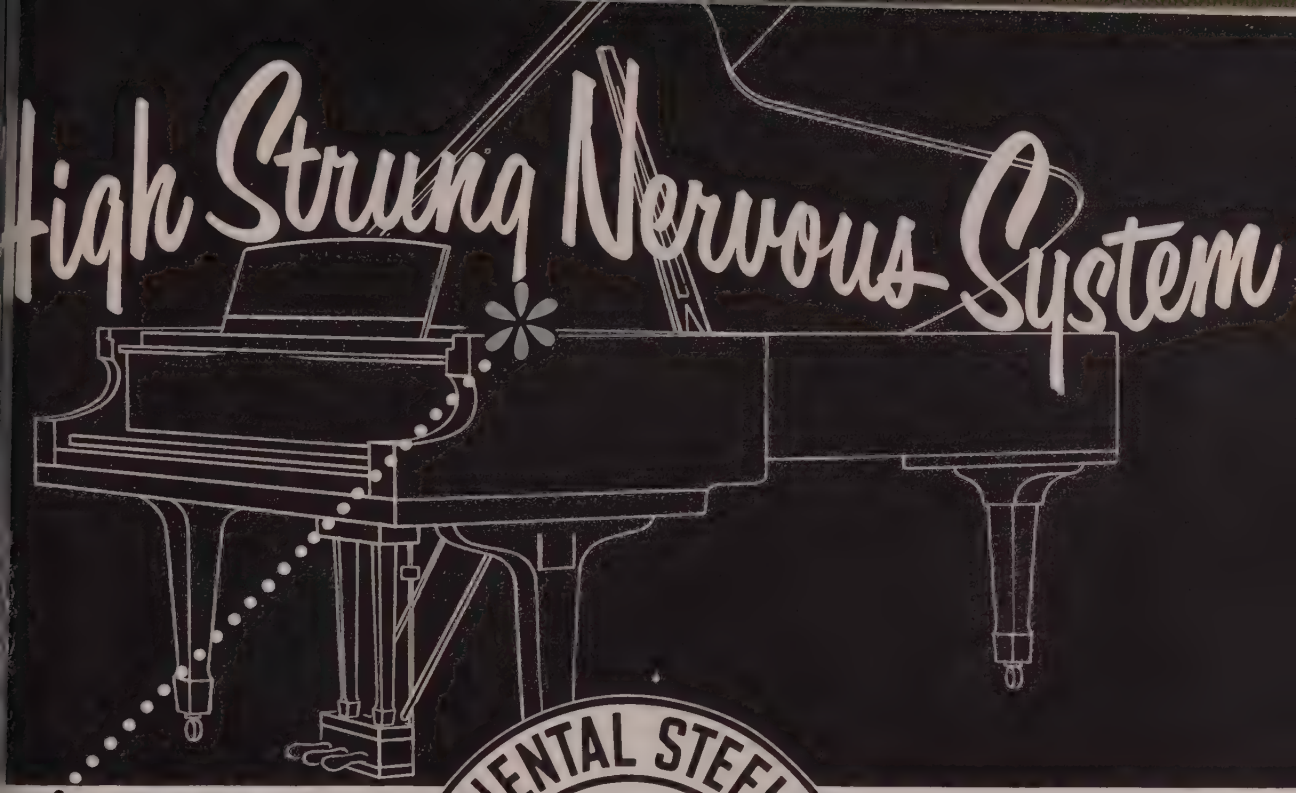
The first job undertaken on a commercial basis produced a torsion tube for a tandem truck axle at a saving of about 25 per cent over the former method using seamless tube. Starting with a slug weighing 17¾ pounds, the finished torsion tube weighs 17.4 pounds after a four step processing. Concentricity between inside and outside diameter is held to 0.002-inch.

To produce a 41-pound accumulator cylinder for starting prime movers, a 42-pound slug of 1012 steel is used. Inside surface finish is critical on this job so it is found possible to hold it to about 10 microinches for subsequent honing to the 2-microinch finish required. It is believed possible to flash chrome plate the internal surface to bring it within the required tolerance for finish and reduce finished costs still further. Production cost is brought down to $10 from $18.50 using the former method.

Not all the jobs are necessarily limited to larger sized slugs. On a die stripping cylinder for standard punching sets, a 25 per cent saving over former methods resulted on a unit with a final weight of 2 pounds, 1 ounce. Here again special steels are not required with the part being extruded from 1010 or 1012 steel in two backward and one forward extrusion. Material savings are sizable as there is less than an ounce of difference between the slug and the finished part where 7 pounds of steel were formerly required.

Wrap up Safety Services

All the National Safety Council's materials and services are wrapped up in the recently-published "Occupational Safety Service." Copies are free from the council, 425 N. Michigan Ave., Chicago 11.



piano strings wound with . . .

CONTINENTAL STEEL CORP. KOKOMO, IND.
STEEL
*CONTINENTAL
REG. U.S. PAT. OFF.
WIRE

FINE WIRE

Other Uses Made of CONTINENTAL Fine Wire

- Matchbook Staples
- Preformed Staples
- Broom Binding Wire
- Box Stapling Wire
- Florist's Wire
- Spiral Binding Wire
- Tag Wire
- Wire for Toy Wheels
- Paper Clips
- Common Pins
- Automatic Pencil Lead Plungers
- Yoke Winding for T.V. Picture Tubes

From the skilled hands of the concert pianist . . . to the opera singer's wire bound bouquet . . . Continental fine wire performs to the exact specifications for which it is designed. Continental fine wire quality and follow-through service is not just an established formula, but real application engineering. Every conceivable quality control . . . every case history, and every special order receives constant analysis. Continental specializes in wire for thousands of applications in practically any size, temper, finish, shape and analysis. Write or phone Continental at Kokomo, Indiana. Let's talk over your wire problems.

*Trade Mark Reg. U. S. Pat. Off.

CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

DUCERS OF *Manufacturer's Wire* in many sizes, es, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

TEAM SERVICE by U·S·Steel Supply is up-to-date!

WAREHOUSE SUPT.

TELEPHONE SALESMAN

INVENTORY ANALYST

SALESMAN

DISTRICT MANAGER

RECEPTIONIST

OFFICE MANAGER

CREDIT MANAGER

TRAFFIC MANAGER

WAREHOUSEMAN

ASS'T. DIST. MANAGER

PRODUCT SPECIALIST

He specializes in solving *your* technical troubles!

• Our product specialist can give you expert advice on the selection of steel for a particular purpose, and on the choice of tools, equipment and machinery that can frequently speed up your production. He can interpret and develop specifications to fit your needs, and can advise on the methods of handling various kinds of steel and steel products during your production operations.

When you need technical advice from a product specialist, contact your U. S. Steel Supply salesman. He will put the right man to work for you.

U.S. STEEL SUPPLY

DIVISION

General Office: 208 So. La Salle St., Chicago 4, Ill.

Warehouses and Offices Coast to Coast

UNITED STATES STEEL

NEW PRODUCTS and equipment

Reply card on page 115 will bring you more information on any new products and equipment in this issue

Light Stock Manipulator

. . . converts standard truck

The Manipulet light stock handler meets requirements for a lightweight, low-cost machine that will manipulate hot forging stock in hammer or press operations. The model handles stock up to 500

pounds in its smaller series, 1500 pounds in the larger. It converts a standard lift truck into a forging manipulator by incorporating a hydraulically-actuated apparatus.

The entire mechanism is mounted on the elevating track of almost any make lift truck. One man operating the truck-handler can replace a crew of two, three and sometimes four. Use of cranes, slings, porter bars and other auxiliary equipment becomes unnecessary. Salem-Brosius Inc., Dept. ST, 248 Fourth Ave., Pittsburgh 22, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Antifriction Bearing Centers

. . . contact bearings in duplex

Red-E shank type center features antifriction single row angular contact bearings in duplex. As the amount of offset is accurately controlled, duplex mounting provides a definite degree of preload, maximum resistance to deflection under both thrust and radial loads. High speed steel point is replaceable. Centers are available in almost all tapers, straight or tapered shanks, with special heads and points, or made to order. Ready Tool Co., Dept. ST, 554 Iranistan Ave., Bridgeport, Conn.

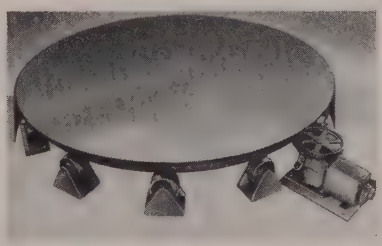
FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Power-Driven Turntable

. . . self-aligning gear drive

Industrial turntables, made in diameters to 8 feet and capable of capacities of up to 10 tons, are equipped with positive self-aligning mesh gear drives. Turntables feature a totally-enclosed gear reduction unit, have antifriction bearings throughout, remote push-button controls for forward, stop and reverse action.

Lubrication fittings are designed to provide the most simple accessibility. Pit depths of 15 inches



are required for installation flush with the floor. Chase Foundry & Mfg. Co., Dept. ST, 2800 Parson Ave., Columbus 7, O.

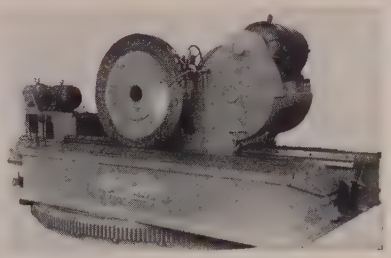
FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Rotary Planer

. . . mills structurals, castings

Model 3 rotary planer, made for milling structural members and castings, such as ingot molds, can be furnished with various cutter head diameters to suit particular needs. Illustrated is a 48-inch cutter head with 4-inch in and out adjustment by hand wheels arranged so adjustment can be made from either side of the carriage.

Planer is equipped with electrically-controlled hydraulic feed for cutter head travel. Planing length is 7½ feet; feed, from 1 inch to 10½ inches. Cutter head operates at 50 fpm. Machine can be furnished with or without circular



base. Cleveland Punch & Shear Works Co., Dept. ST, Cleveland 14, O.

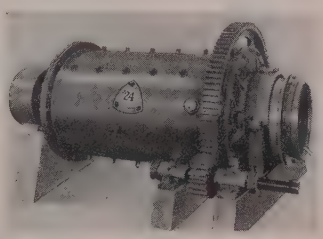
FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Improved Ball Rod Mill

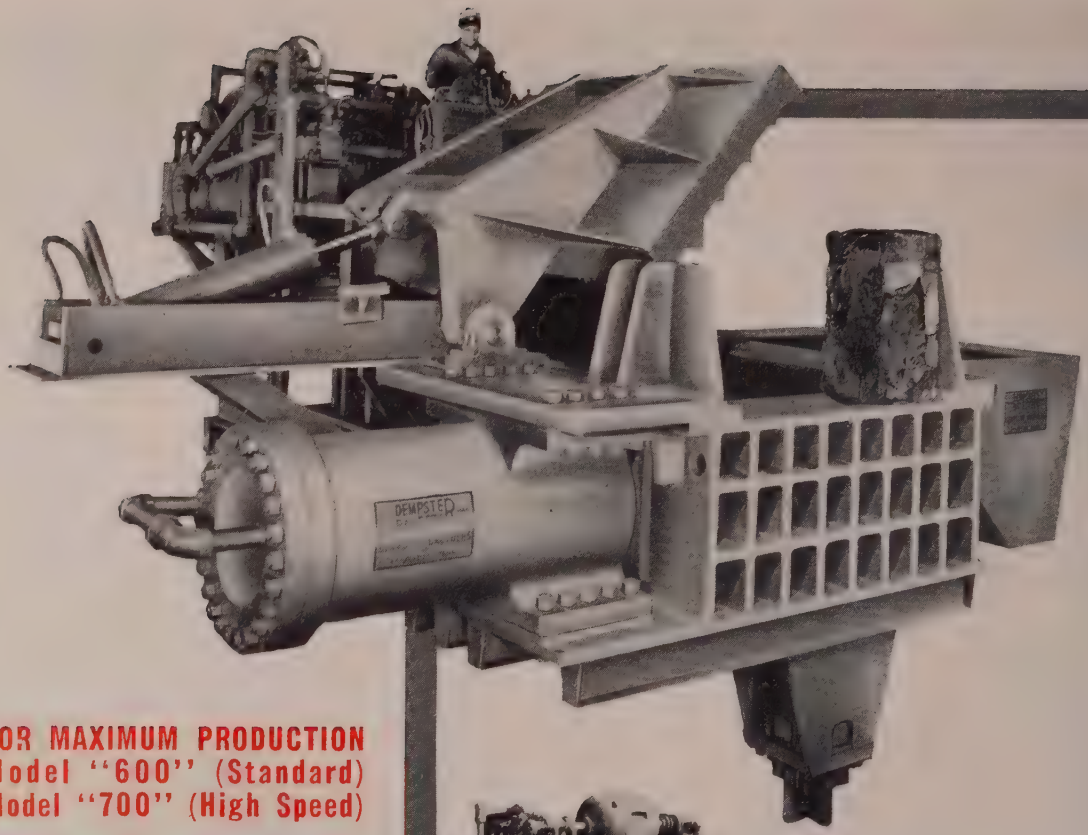
. . . flexible for mill, regrind

Greater convenience in modification and simplified maintenance are improvements made in this 30-inch diameter convertible ball rod mill. Any length can be increased to 72 inches by increments of 18-inch sections.

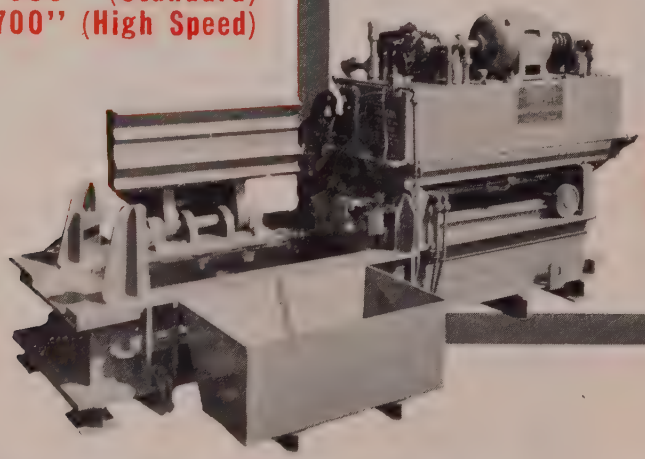
Type of discharge opening—



small, medium or large trunnion overflow—can be changed readily by installing the correct throat lin-

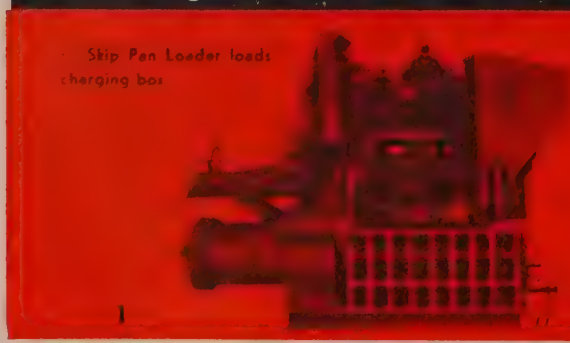


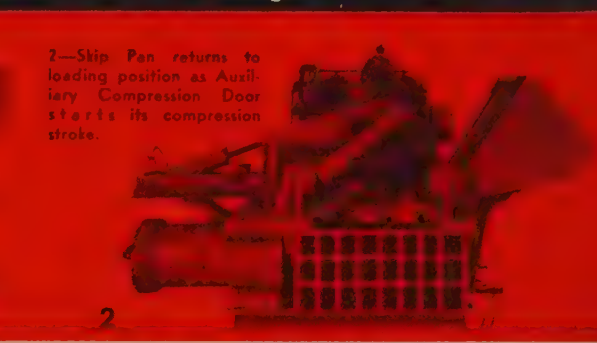
FOR MAXIMUM PRODUCTION
Model "600" (Standard)
Model "700" (High Speed)



FOR PORTABLE PRODUCTION
Model "125" (Standard)
Model "128" (High Speed)

Action photos below illustrate Dempster-Balester's





DEMPSTER BROTHERS

THERE IS A DEMPSTER-BALESTER BUILT TO PRODUCE BALES OF ANY DESIRED SIZE

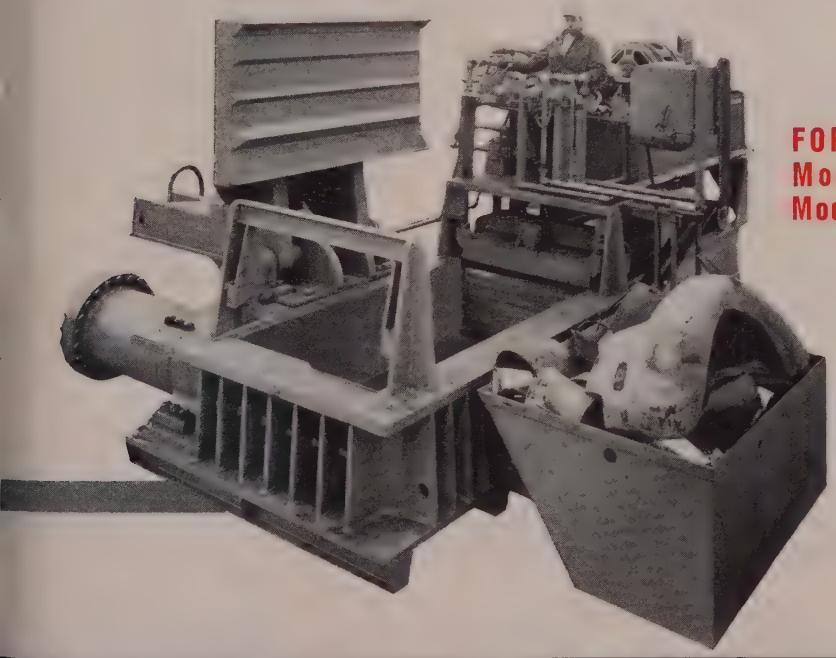
Choose One of the 6 DEMPSTER-BALESTERS . . . Offering You the Closest Approach Yet to "AUTOMATIC BALING"!

Here are the *Dempster-Balesters* that have become widely recognized during the past decade for top production and low cost operation. In over 200 cities and almost every state of the union, as well as 15 foreign countries, *Dempster-Balesters* are making scrap metal baling highly profitable!

The key to the greater profits provided by *Dempster-Balesters* is fast, consistent baling. This speed and consistency is due, chiefly, to the *Dempster-Balester's* 1-2-3-4 hydraulic operation as illustrated in detail in photos below.

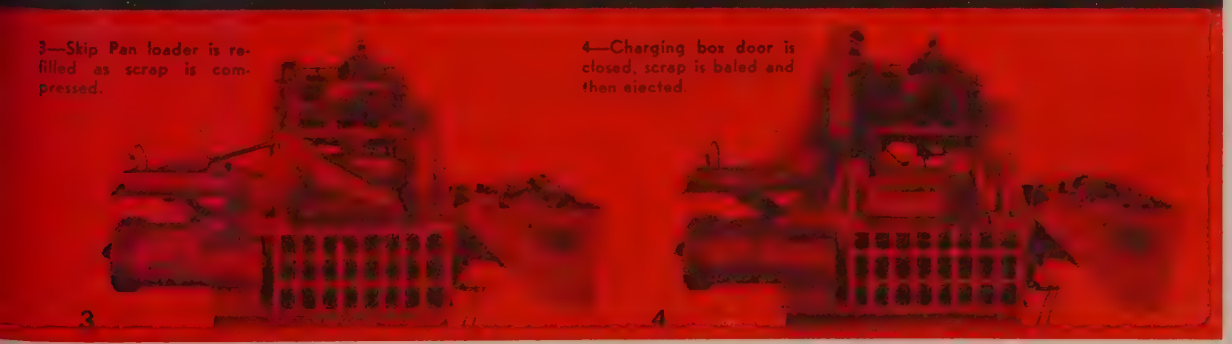
The low cost operation of *Dempster-Balesters* has been an important factor in the demand for these presses. This low cost operation is the result of simplified engineering and construction. There are no gadgets on a *Dempster-Balester*. Each and every part of the machine is there for a definite and practical use. All hydraulic assemblies are integral to the machine itself. Even the Standard Model 600 and High Speed Model 700 presses are self-contained requiring no air compressors, springs, counterweights or supplementary equipment.

Without question, *Dempster-Balesters* are your best possible buy. And you have six to choose from . . . three standard and three high speed models that turn out high density bales in capacities to meet any requirement from 1 to 9 tons per hour. For complete information, write us today. A product of Dempster Brothers, Inc.



FOR LARGE PRODUCTION
Model "275" (Standard)
Model "350" (High Speed)

Fast and Power-Packed 1-2-3-4 Hydraulic Operation

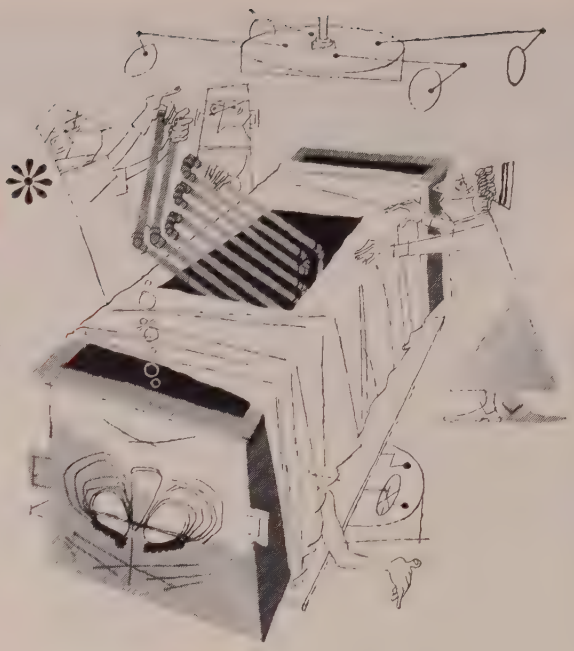


643 Dempster Bldg., Knoxville 17, Tennessee

has

coil-itis

got you constantly doctoring your tanks?



Like the human appendix, pipe coils often give constant trouble until they are removed and replaced with Platecoils. Immediately, you will notice the difference as Platecoils put new life and profits into your heat transfer processes. They heat or cool 50% faster. They take 50% less space in the tank leaving room for greater payload. Platecoils overcome the limitations and operating difficulties of old fashioned and outmoded pipe coils to save hours of downtime.

It costs less to cure coil-itis with Platecoils than to suffer its evils.

Write for Bulletin P72 today!

PLATECOILS SAVE 50% IN HEAT TRANSFER COSTS

PLATECOILS REQUIRE 90% LESS CLEANING

At Motor Wheel Corporation cleaning time has been cut from 10 hours per pipe coil every 60 days to only one hour per Platecoil. Ask about other case histories.

PLATECOIL

REPLACES PIPE COILS

Coil-itis — Diagnosed as tank heating and cooling problems. Platecoils — the prescription for solving pipe coil problems.

PLATECOIL DIVISION, KOLD-HOLD MANUFACTURING CO., LANSING 4, MICHIGAN

er in the discharge trunnion. Grate liners can be used by installing the proper head and throat liners. No other changes are necessary. These features make the mill flexible for use in small milling plants or as a regrind unit. Denver Equipment Co., Dept. ST, 1400 17th St., Denver 17, Colo.

FOR MORE DATA—CIRCLE REPLY CARD NO 5

Trolley Conveyor

. . . takes all load carriers

This 4-inch Loadstar trolley conveyor is applicable for all general trolley work where precision equipment is indicated. The wheel is made with steel or felt seals, with hardened inner and outer races. Chrome steel balls are retained in a pressed steel cage. Outer ball races are ground, tire surfaces hardened by special process.

Standard bracket is drop forged and hooks, trays or any type of load carrier can be applied to the chain. Mathews Conveyer Co., Dept. ST, Ellwood City, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Sand Moisture Determinator

. . . continuous flowing sample

Continuous electrical moisture determination machine takes a flowing sample of core or molding sand from a conveyor or mill. Called the Waterteller, it operates with a stream of riddled sand falling on a rubber-faced rotating disk, strikes off the sand to a constant volume and then rams it to a predetermined hardness.

Controlled sand ribbon is then subjected to a high potential voltage. The higher the moisture content, the greater the distance the

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

70. Large Induction Motors

Electric Products Co.—Features of large wound-rotor and squirrel-cage polyphase induction motors are discussed in 6-page illustrated folder 37-200. Motors for both constant and adjustable speed drive applications are covered.

71. Barrel Plating Machines

Frederic B. Stevens, Inc.—Both C and Super E models of the automatic barrel plating and processing machine are described and applications given in 8-page illustrated brochure No. 60. Machine's use for phosphate coating of mortar shells and washing of small parts is pictured along with its automatic loading and unloading features.

72. Worm Gear Drives

Foote Bros. Gear & Machine Corp. —80-page illustrated and thumb-indexed engineering manual HGB contains detailed information on Hygrade enclosed worm gear drives of single worm, helical worm and double worm reduction types. You'll find specs, application and selection data.

73. Thin Locknuts

Standard Pressed Steel Co.—For commercial and aircraft use, Flexloc locknuts, one-third lower in height than regular, are described in 26-page catalog. Full ordering information and performance data are given. It is reported that tensile strength is not materially lowered by the reduction in height, and that many performance advantages are gained.

74. Electronic Instruments

Minneapolis - Honeywell Regulator Co., Brown Instruments Div.—48-page illustrated catalog 1520 contains factual information on ElectroniK noncontrol precision instruments which measure temperature, pressure, flow, pH and other variables. Manual covers operation, application and other data on equipment for process and research operations.

75. V-Belt Drives & Sheaves

Pyott Foundry & Machine Co.—Incorporating revised data, 56-page catalog and reference book V-1000 contains all information required for specifying pyott drives, Vee-Tex belts and sheaves. Drives from 1 to 1000 hp are included.

76. Carbide Data

Vascoloy-Ramet Corp. — 56-page carbide catalog VR-441 shows complete line, including 15 new items of blanks, tools and toolholder inserts with 12 pages of technical information on carbide and its use. Photos, drawings, application sketches and ordering information, which includes styles, sizes, grades, package quantities and prices, are charted. Technical data section has been enlarged.

77. Automatic Demineralizer

Penfield Mfg. Co.—All functions, including the regeneration cycle, are completely automatic with the model MA Mono-Column Demineralizer described in new data sheet. Cation and anion exchangers are mixed in a single tank unit through which the water passes only once. Data sheet gives complete information in a concise form.

78. Sprag-Type Clutches

Formsprag Co.—A 6-page illustrated folder, and four pages of engineering data, describe a line of overrunning, indexing and back-stopping clutches made with a full complement of sprags. Application data is given for units said to give great torque capacity for size and weight.

STEEL 4-27-53

Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

NAME _____ TITLE _____

COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY AND STATE _____

This card MUST be completely filled out. Please TYPE or PRINT

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

FIRST CLASS
Permit No. 36
(Sec. 34.9 P.L.&R.)
CLEVELAND, OHIO

BUSINESS REPLY CARD

No Postage Stamp Necessary if Mailed in the United States

—POSTAGE WILL BE PAID BY—

STEEL
Penton Building
Cleveland 13, Ohio

Readers Service Dept.

79. Handling Equipment

Yale & Towne Mfg. Co.—40-page catalog gives an interesting picture story of a complete line of materials handling equipment in use, including hoists as well as power, pallet, freight and lift trucks of various types with useful data on features.

80. Designing, Tools, Machines

Euclid Industrial Design Co.—Industrial design service of this company, along with the special cutting tools, jigs and fixtures, dies and special machinery it manufactures are detailed in series of illustrated bulletins.

81. Production Dies

B. Jahn Mfg. Co.—"The Story of B. Jahn Production Proved Dies" is brochure which illustrates dies being 'production proved' by running up to 50,000 parts for production line use before die is shipped. Company facilities are described and problems overcome are shown.

82. Silicon Steels

Republic Steel Corp.—Profusely illustrated 76-page booklet "Republic Silicon Steels for the Electrical Industry" contains large fund of engineering data on coiled silicon strip and sheets. Identified as form Adv. 449, booklet covers data on various grades of silicon steel, including magnetic and other properties. Designers and makers of electrical equipment will be most interested in booklet.

83. Abrasive Cut-Off Saws

Henry H. Wise Co.—Four models of abrasive cut-off saws are subject of four-page illustrated bulletin. Saws use 7½ or 10 hp motors and 18 or 20 in. wheels. Attachments and wheel grade selection data are included.

84. Machine Tools

Cincinnati Milling Machine Co. — Specifications and design features for line of milling, lapping, grinding, broaching, die sinking, metal forming, flame hardening and cutter sharpening machines are found in 52-page illustrated publication M-1776. Also covered are grinding wheels and cutting fluid.

85. Grinding Tools & Equipment

Dumore Co.—In the 40 pages of illustrated catalog No. 53 you'll find completed data on tool post and hand grinders, flexible shaft tools, automatic drill heads, light drilling equipment and drill grinders. Specs, operating and design information and an accessories section are included.

86. Remelt Steels

Cannon-Muskegon, Inc.—Brochure "MasterMet Certified Alloys" describes a new service whereby precision casting foundries can obtain stainless, "super" stainless and alloyed tool steels specifically developed for remelting purposes. Plant facilities are described in detail.

EDITORIAL REPRINTS:

87. Ceramic Coatings

In STEEL reprint "Ceramic Coatings Boost Alloy Steel Use" F. D. Shaw of Bettinger Corp. reports that high temperature ceramic coating is gaining more applications in the field of permanently finished metals. Developed to meet metal shortages, coatings also help reduce cost through lower maintenance and longer life.

88. Zinc Oxidation

"Liquid Blanket Reduces Oxidation of Molten Zinc" is title of STEEL reprint which describes experiment with liquid blanket to reduce loss of zinc in wire galvanizing due to formation of oxide and dross. Regenerative crystals added to bath serve to maintain fluidity of blanket. A. A. Paterson of Dewey & Almy Chemical Co. tells the story.

89. Cutting Fluids

How the four basic properties of cutting fluid affect tool failure due to heat, wear, and welding are considered in STEEL reprint "Cutting Fluids: Their Role in Machining." Effect on surface finish is also studied in article.

90. Dual Frequency Heating

Low frequency coils in tandem with high frequency high heat coil prove that induction heating can be practical in forging application, M. E. Hackstedde, manager at GEC Inc. describes this type heating, its installation at the Canadian Arsenal Ltd. plant, Lindsay, Ont. and its future possibilities in STEEL reprint "Dual Frequency Heating: Low Costs Open New Fields."

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States
— POSTAGE WILL BE PAID BY —
STEEL
Penton Building
Cleveland 13, Ohio

FIRST CLASS
Permit No. 36
(Sec. 34.9 P.L.&R.)
CLEVELAND, OHIO

Readers Service Dept.

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

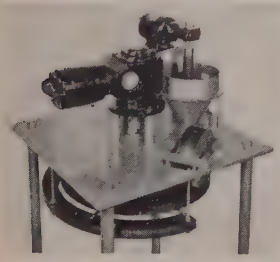
STEEL
Penton Building, Cleveland 13, Ohio
4-27-53

Please send literature or detailed information on subjects circled at left to—

NAME
TITLE
COMPANY
PRODUCTS MANUFACTURED
ADDRESS
CITY AND STATE

This card MUST be completely filled out. Please TYPE or PRINT

electrical current will flow. This is expressed in distance over a well expanded scale. A simple electrical circuit is employed to control



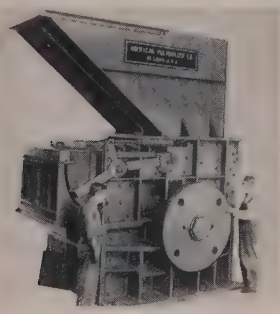
rate of water flow into a sand mill, tempering sand to a predetermined moisture content. Harry W. Dietert Co., Dept. ST, 9330 Roselawn Ave., Detroit 4, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Metal Turnings Crusher

. . . reduces 30-50 tons per hour

Heavy-duty crusher is designed to reduce metal turnings, aluminum castings and other forms of scrap at a rate of 35 to 50 tons per hour. It is recommended for large-scale

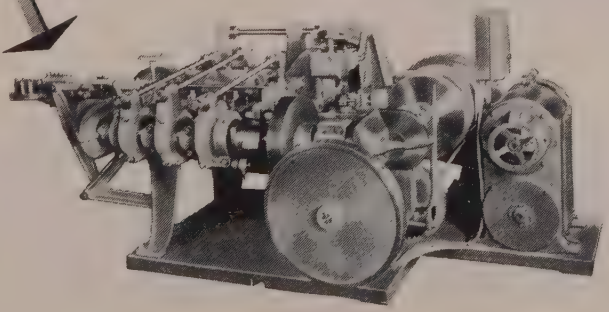


operations in industrial plants, aluminum smelters and metal recovery yards.

Model 60-50 employs the manufacturer's rolling ring principle. It exerts tremendous kinetic and centrifugal force on turnings or castings through manganese steel

USE A REPLY CARD
Just circle the corresponding number of any item in this section for more information.

Save Metal
Save Labor
NILSON FOUR-SLIDE
Wire and Ribbon Metal
FORMING MACHINES
Mounting production costs are driving firms out of the competitive picture. Too much scrap metal! Too many single operation machines! Too many operators! This whole picture can be changed to a highly profitable operation. Install a NILSON combination press and 4-Slide forming machine. This machine takes wire or ribbon metal directly from the coil, straightens, feeds, pierces, blanks, swages, stamps, or coins, cuts off and forms . . . automatically in one quick precise operation. See the new picture? . . . Increased production! Minimum scrap metal! One machine for all operations! One operator!
For specific recommendations . . . send details of your operation.
THERE'S NOTHING LIKE A NILSON
NILSON has been specializing in Forming Equipment for over 50 years.
THE A. H. NILSON MACHINE COMPANY
1512 Railroad Avenue • Bridgeport 5, Connecticut
CHICAGO • CLEVELAND • DETROIT • LOS ANGELES • HAMILTON, ONT., CANADA



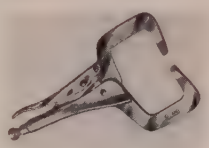
shredder rings. Rings deflect and pass over heavy tramp metal that might damage the crusher. Because the rings roll, wear is distributed over the entire cutting edges.

To further extend life, rings are reversible. American Pulverizer Co., Dept. ST, 1539 Macklind Ave., St. Louis, Mo.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Toggle C-Clamp

. . . extra reach, rapid lock



Extra reach and rapid locking action are two features of this vise-grip C-clamp. An adjusting end screw presets jaw opening to the size of the work. Then the clamp is applied and locked on with one hand.

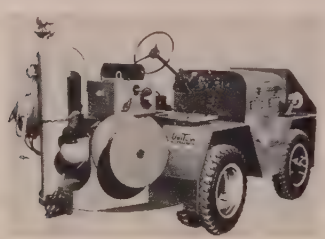
Large working space between jaw arms means difficult jobs can be clamped with ease. Petersen Mfg. Co. Inc., Dept. ST, DeWitt, Nebr.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Mobile Welding Tractor

. . . on-the-spot work anywhere

Welding equipment, materials and men for fast on-the-spot work are moved by this Unitow welding tractor. It saves time by moving quickly around plants or among widely separated buildings, avoiding waits for installation of elec-



tric power lines or delivery trucks. An International Harvester engine operates both tractor and 300 or 400-amp generator. Direct drive power take off eliminates belts.

Tractor's 118-inch turning radius and 65-inch height enables it to navigate narrow aisles, low doorways and crowded platforms. It is sufficiently powerful to do double duty as a towing and pushing tractor and car spotter. Hensel Green & Co., 9 S. Clinton St., Chicago 6, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Protective Finish

. . . for magnesium

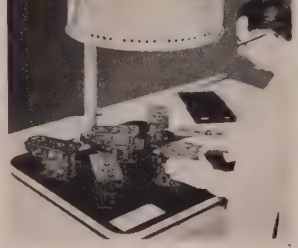
Iridite No. 15 (Mag-Coat) is a protective finish for magnesium. It converts the surface of treated magnesium to an entirely new and chemically different surface. It is applied by immersion and will not chip, flake or peel when bent. Allied Research Products Inc., Dept. ST, 4004 E. Monument St., Baltimore 5, Md.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

High-Capacity Light Generator

. . . 20-inch diameter source

Monochromatic light generator features a 20-inch diameter, high-intensity source. The instrument was developed to provide greater capacity so large parts or large numbers of smaller parts can be



checked more easily and rapidly for surface flatness, finish, dimension, etc.

Work height capacity of 24 inches permits inspection of parts having considerable thickness. Groups of parts to be checked with optical flats can be allowed to normalize at the light source. Light-generating element in the Monolight is mercury vapor. DoAll Co., Dept. ST, Des Plaines, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Automatic Strain Recorder

. . . cuts manhours, human error

Reduction in manhours and in human recording error is effected by three models of automatic metal strain recorders. Models 108 and 109 are made for use with conven tional contact-type indicators. S or twelve input channels are fur ished for independent or simulta eous operation. For short-tin tests, recording time can be r duced to 12 seconds or 4½ secon per print.

In model 110, the strain-sensi means is provided by electrical di ferential transducers for direct a tachment to extensometer rod Gilmore Industries Inc., Dept. S 5511 Euclid Ave., Cleveland 3,

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Spring-Loaded Tool

. . . live-center design

Live center, spring - loaded tool has precision preloaded journal bearings for high loading capacities while sustaining maximum rigidity. Th high speed steel tool point mai tains a guaranteed concentricit of 0.0003-inch total indicator rea ing. Knurling cannot disturb a curacy.

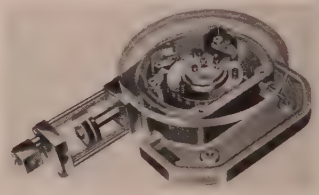
Massive journal bearings pr clude breakage or early bearin failure that can result from ur controlled end thrust. Bulto Co., Dept. ST, Box 5094, Sout field Station, Detroit 35, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Dial Feed Tables

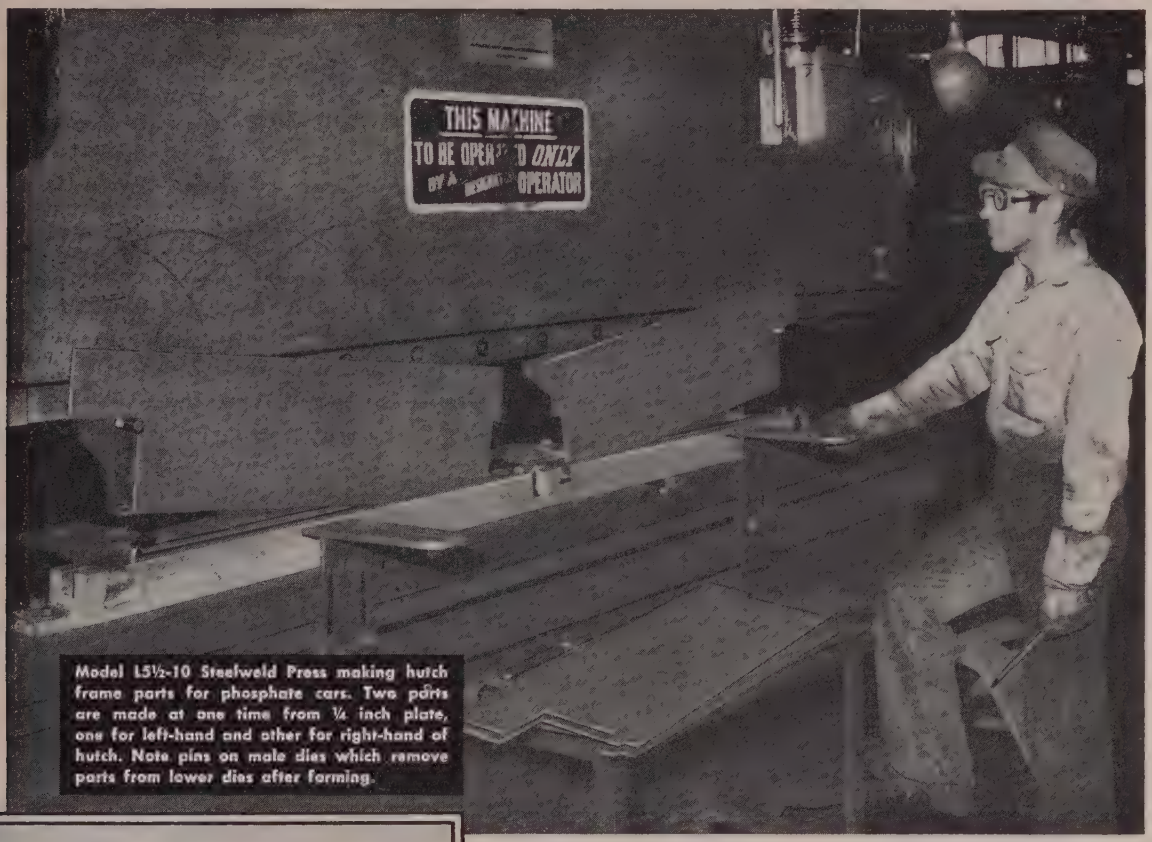
. . . top plate cannot lose inde

Top plate cannot override an lose index under the most sever operating conditions as a result the positive lock feature in th

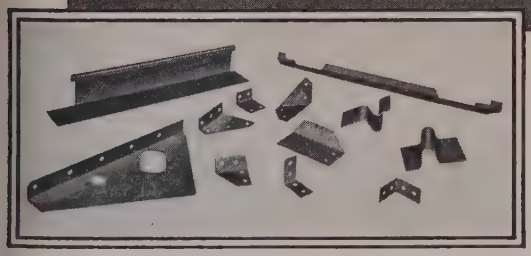


dial feed table. Lock is achieved b use of an auxiliary air cylinde built inside the table. Function i to bring into toggling position set of mechanical members tha lock the feed pawl to the ratche In the indexed position, a paw locks the table against rearwar rotary motion.

PULLMAN-STANDARD FINDS MANY USES FOR STEELWELD PRESS



Model L5½-10 Steelweld Press making hutch frame parts for phosphate cars. Two parts are made at one time from ¼ inch plate, one for left-hand and other for right-hand of hutch. Note pins on male dies which remove parts from lower dies after forming.



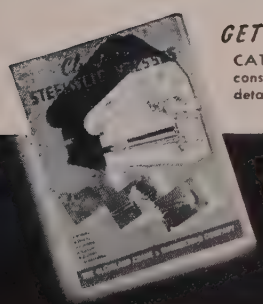
A few of the many parts produced within a short period on the Steelweld Press. Curves and bends of every shape and degree are formed quickly and accurately.

"The more we use our Steelweld Bending Press, the more we learn about what it can do for us", said the Day Superintendent of Pullman-Standard Car Mfg. Co., Butler, Penna. "As a result it is handling more and more of our work. We are doing a great many forming jobs on it that did not occur to us as being possible when we first installed the machine."

An endless variety of parts are produced on this press. These are mostly of ¼ and ⅜ inch steel plate and involve curves and bends of every description for gussets, fulcrums, braces, frames, housings, etc. used in the manufacture of railroad cars.

The dies used are relatively simple and made in the company's shop. Because dies are easily changed, it usually takes about an hour to set up for a new job.

If you work with metal plate in any thickness up to one inch, for bending, forming or punching, you should get the facts on the many features of Steelweld Presses.



GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7830 EAST 281st STREET • WICKLIFFE, OHIO

STEELWELD

BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

BEND LARGE STRUCTURALS, OTHER SHAPES at cost-cutting speeds

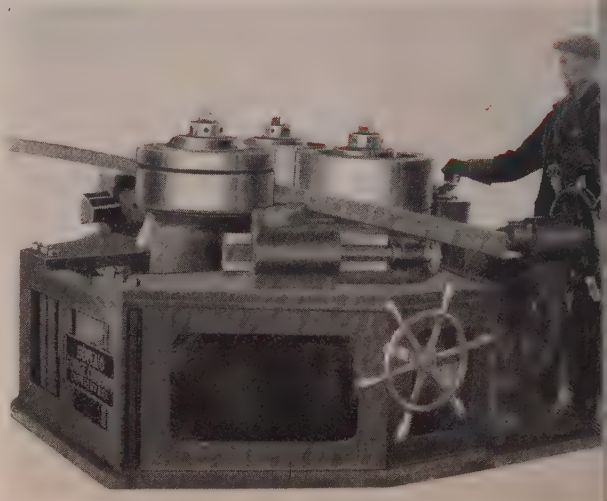
—with this "Buffalo" NO. 4 BENDING ROL

SHAPE	MAX. SIZE
1. Angles - leg out	8 x 8 x 1
2. Angles - leg in	8 x 8 x 1
3. Beams on flanges	15″ - 60#
4. Channels - flanges out	15″ - 55#
5. Channels - flanges in	15″ - 50#
6. Flats on edge	8 x 1½
7. Flats on flat	12 x 3
8. Rounds and squares	5 - 4½
9. Standard st. pipe	8
10. X heavy pipe	6
11. XX heavy pipe	5

Other Advantages in using "Buffalo" BENDING ROLLS

- Quick roll changes — little time loss between runs
- Almost unlimited variety of shapes can be bent
- Easy operation — quick release of finished work
- Horizontal or vertical models to fit your operation
- Complete range of sizes, down to the smallest shapes

WRITE FOR ENGINEERING BULLETIN 352-C for all construction details as well as minimum diameters and all capacities. If you bend metal, you'll do it cheaper with a "Buffalo" Bender!



No. 3 Horizontal Bending Roll

DIAMOND JUBILEE 75TH ANNIVERSARY

"Buffalo" MACHINE TOOLS

BUFFALO FORGE COMPANY

158 MORTIMER STREET BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING CUTTING BENDING

A hydraulic check offered as an accessory provides a controllable shock-absorbing effect at the end of every index stroke for operations that require extra smooth work. A. K. Allen Co., Dept. ST, 57 Meserole Ave., Brooklyn 22, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Pipeless Hydraulic Press

. . . for cold-drawing, nosing

Pipeless 500-ton hydraulic drawing and forming press is designed

specially for cold drawing and nosing artillery projectiles. Die space is made smaller than standard, the intense pressure developed in the process requiring less area. The press is constructed without piping in the main hydraulic circuit.

All high pressure fluid is conducted through short, direct passages drilled in the structural parts. Result is quiet, shockless operation with low maintenance. Elmes Engineering Division, American Steel Foundries, Dept. 1150-X ST, Tennessee Ave., Cincinnati 29, O.

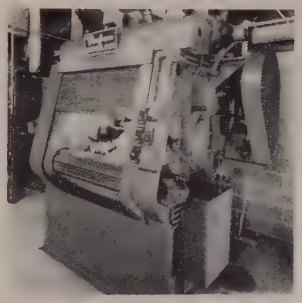
FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Expanded Blast Cleaning Line

. . . capacities: 3 and 18 cu ft

Available previously in 6 and 12 cu ft sizes, the Blastmaster Roto-blast barrel line is expanded with addition of 3 and 18 cu ft barrels. Features of the expanded line include an abrasive-tight door of all-metal construction laminated with rubber back to protect it from flying abrasive. Side edges have rollers that travel in a mechanical labyrinth.

Work conveyor drive has automatic torque throwout arm protection to eliminate possibility of



damage to equipment in case of jamming. Metal conveyor slats are designed so at no time is any opening presented to pinch the work or clog. Pangborn Corp., Dept. ST, Hagerstown, Md.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Bench Grinder Series

. . . small to heavy-duty range

A series of four bench grinder models provides a complete capacity range for small shop service through heavy-duty continuous operations. Grinders have totally enclosed motors with dynamically balanced rotors to assure vibrationless operation. Heavy wheel guards, designed for maximum work clearance, are removable.

All grinders run at 3450 rpm, except the largest model, which

turns at 1750 rpm. The three larger models are provided with end shields, built-in exhaust outlets and spark arrestors. Porter-Cable Machine Co., Dept. ST, Syracuse, N.Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Improved Electrode

. . . gives little spatter

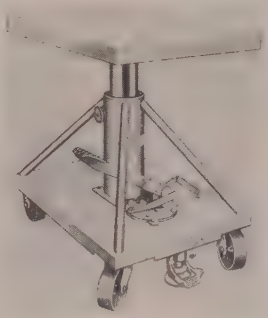
Murex type R electrode is used in general shop welding and repair work. It is said to give a small amount of spatter, uniformity of arc behavior and has ability to take high currents without coating breakdown or change of performance as electrode is consumed. Metal & Thermit Corp., Dept. ST, 100 E. 42nd St., New York 17, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Hydraulic Utility Table

. . . top rotates, raises, locks

Heavy-duty 24 x 35-inch work top rotates a full 360 degrees and can be raised or lowered in locked or unlocked position on this 1-ton capacity hydraulic utility table. Top is formed from a single-piece



reinforced steel plate and proper load distribution is assured by four tubular trusses welded to the center column and base.

Free-wheeling 6-inch roller bearing casters give maximum mobility. A two-speed foot pump that permits faster raising of lighter loads is standard equipment. Table has 28-inch lowered height, 44-inch elevated height. Rack Hydraulic Equipment Corp., Dept. ST, Connellsville, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20

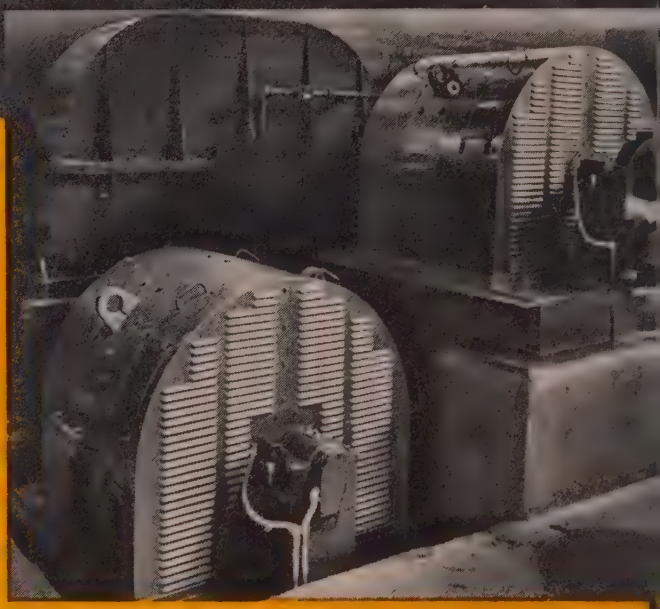
Carton Banding Conveyor

. . . fits all standard conveyors

Easy passage of banding tape through underpass and up a vertical deflector channel is one feature of the Banding Helper conveyor. A channeled midrib is included to receive lengthwise band from a separate roll placed under the conveyor.

The unit functions as part of a conveyor line and is available for any standard conveyor widths. For special requirements, it can be made with length and width to fit specific maximum container sizes.

Delivery end of mill, with Elliott 20-hp and 75-hp, 300/1200-rpm reel motors in tandem at right, for adjustable tension on heavy and light strip. Duplicate motors drive reel at opposite end of mill.



Twin drive for mill back-up rolls ▶ with two Elliott 300-hp, 450/900-rpm motors. All machines are designed for fast acceleration and deceleration.

Elliott five-unit 740-kw generator set provides adjustable ▶ voltage power for mill motors and reel motors. Ventilating equipment in background. All machines are force-ventilated.

motors and generators

..drive four new reversing cold strip mills for Revere Copper and Brass Incorporated

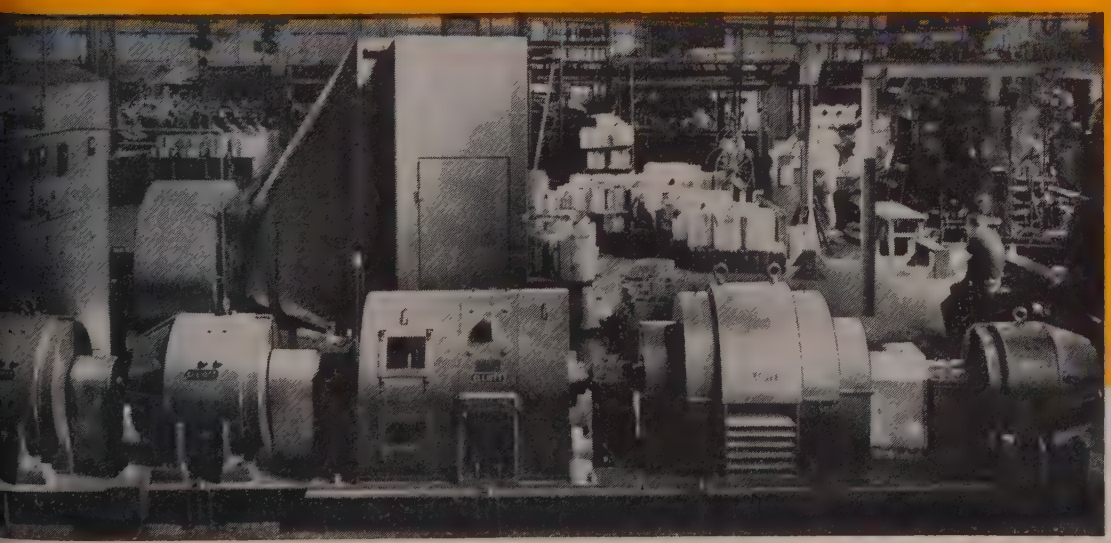
● In these important installations, Elliott supplied not only the adjustable-voltage main drive motors for the four new mills, but also motors for constant-voltage auxiliary drives such as lube drive, screwdown, reel traverse, air-wipe blower, buggyhoist, and roll changer.

Control is Cutler-Hammer, developed in close cooperation with Elliott engineers.

An article giving details of these installations, involving mills designed for rolling brass and copper strips in coils weighing up to 5000 lb. at a mill speed of 500-1000 ft. per min. was published in the Winter issue of our quarterly magazine, POWERFAX. Copies can be obtained from your nearest Elliott Company district office or write direct to Advertising Department, Elliott Company, Jeannette, Pa.

ELLIOTT Company

RIDGWAY DIVISION • CROCKER-WHEELER DIVISION



R3-4

Metzgar Co., Dept. ST, 409 Douglas St. N. W., Grand Rapids 4, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Fabricated Steel Casters

. . . have sealed swivels

Fabricated of mild steel arc welded into resilient unbreakable units, these casters and wheels are available in a wide range of capacities, with sealed swivels and wheel bearings. Tires may be steel, rubber, composition, oil-resistant, static-conductive or plastic. All Steel Welded Truck Co., Dept. ST, Rockford, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

Ammonia-Type Whiteprinter

. . . speed: 6 ipm to 14 fpm

Model S whiteprinter permits anyone in plant or office to print and develop black and colored line whiteprints in volume as fast as needed. It duplicates exactly tracings, drawings, records, charts or any translucent originals. The model uses a 2000-w high pressure Vicor jacketed glass lamp and the

dry ammonia-fume method of diazo reproduction.

Printing speeds range from 6 inches to 14 feet per minute. It develops fully at 8 fpm. The model handles cut sheets or roll stock up to 42 inches wide in any length. Peck & Harvey, Dept. ST, 5650 N. Western Ave., Chicago 45, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 23

Grease Guns

. . . made in giant sizes

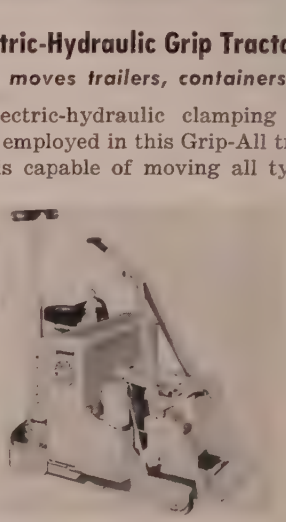
Four giant-size lever type grease guns are available in these models. Two 21-ounce capacity guns developing 10,000 pounds pressure; 32-ounce capacity, 10,000 pounds; 32-ounce capacity, 4300 pounds. Guns can be refilled quickly from a filler pump or by suction. Lincoln Engineering Co., Dept. ST, Natural Bridge Ave., St. Louis 20, Mo.

FOR MORE DATA—CIRCLE REPLY CARD NO. 24

Electric-Hydraulic Grip Tractor

. . . moves trailers, containers

Electric-hydraulic clamping design employed in this Grip-All tractor is capable of moving all types



of four-wheel trailers or containers. Clamping and release mechanism is completely hydraulic. Lower

ARDCOR Engineered
MEANS BETTER COLD-ROLL FORMING

ROLL FORMING MACHINES

PUNCH TYPE CUT-OFFS

LOCK SEAM TUBE MILLS

ARDCORLOY TUBING ROLLS AND FORMING ROLLS
To Your Specifications or Ardcor Design
— for all makes of machines

American ROLLER DIE CORPORATION
20700 St. Clair Avenue · Cleveland 17, Ohio

heads---you win

Flanged and Dished Heads

*when they're made by CLAYMONT

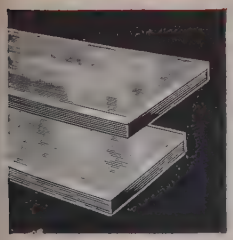
Whatever your needs in flanged and dished heads, you're a winner every time when you call for heads by Claymont.

We can always meet your most exacting specifications because with us the spinning of flanged and dished heads is more than just a job—it's an art into which we put the most painstaking care and specialized know-how.

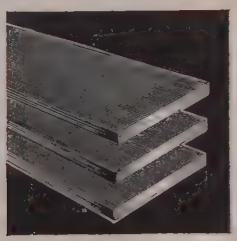
Our flanging department can supply you with flanged and dished heads in diameters from 9 inches to 19 feet and in gauges from 3/16-inch to 6 inches. Made in carbon steel, alloy steel or with stainless steel cladding. We are also prepared to handle head forming operations on both ferrous and non-ferrous metal circles supplied by the customer.

Other Claymont products include Stainless-Clad Steel Plates, Alloy and Carbon Steel Plates, Large Diameter Welded Steel Pipe.

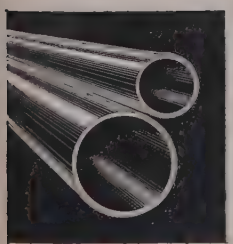
Write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.



Stainless-Clad Steel Plates



Alloy and Carbon Steel Plates



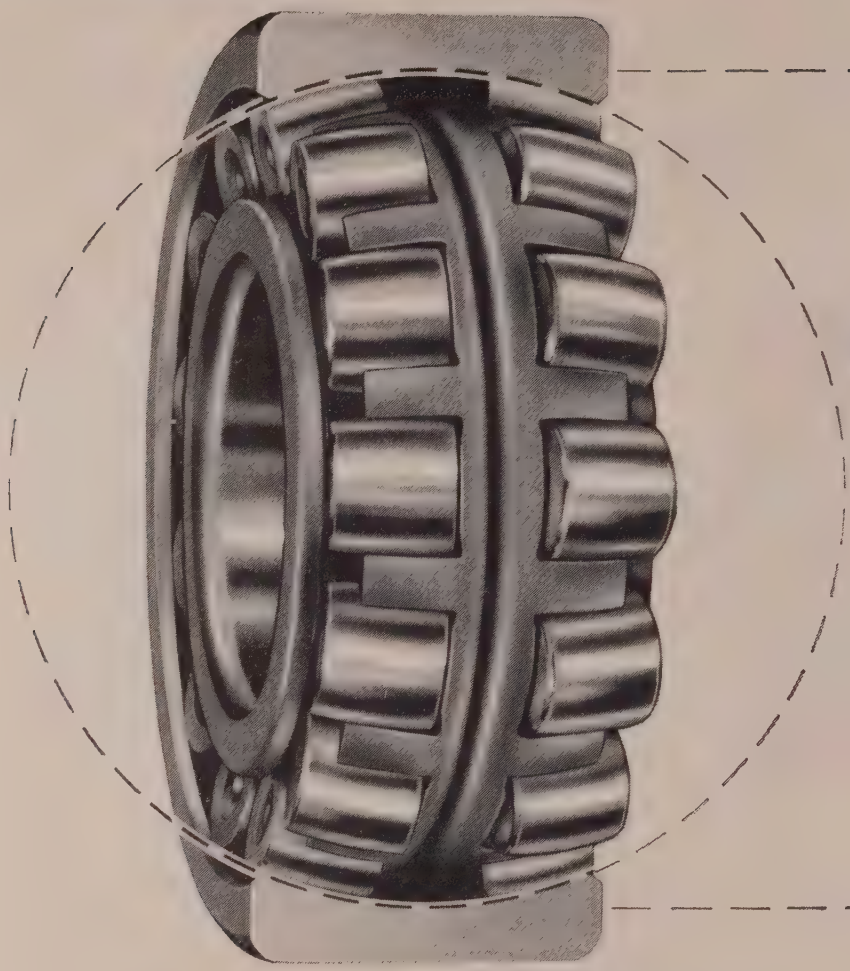
Large Diameter Welded Steel Pipe

THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
Chicago • Detroit • New York • Philadelphia
CANADIAN OFFICES: Toronto • Winnipeg • Edmonton • Vancouver

CLAYMONT STEEL PRODUCTS

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CF&I



where

MISALIGNMENT

can't be helped . . .

you'll find

SKF

Spherical

Roller Bearings

See how the raceway of the outer ring of this SKF Spherical Roller Bearing forms a section of a sphere. This principle of design of the SKF self-aligning bearings compensates for misalignment due to shaft deflection under load, distortion of the foundation, or other causes.

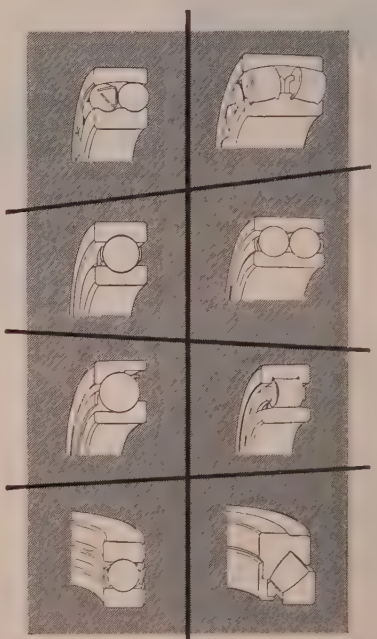
This illustration shows how the principle is also applied to ball bearings, enabling SKF Bearings to operate satisfactorily at high speeds even when some shaft misalignment exists. (The misalignment is exaggerated for clarity.)

Suitable for very heavy radial and thrust loads, SKF Spherical Roller Bearings, like all SKF Bearings, are held well within established tolerance limits, carefully cleaned, protected from rust, and available with cylindrical and taper bores and adapter mountings.

SKF bearings are serving virtually all industry. SKF's unmatched Field and Home Office engineering service helps product designers *put the right bearing in the right place.* **SKF INDUSTRIES, INC.,** PHILADELPHIA 32, PA.—*manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.* 7403

SKF®

BALL AND ROLLER BEARINGS



SKF'S COMPLETE LINE OF ANTI-FRICTION BEARINGS, PLUS **SKF** ENGINEERING CO-OPERATION, HELPS YOU *PUT THE RIGHT BEARING IN THE RIGHT PLACE.*

toothed clamp can be adjusted in or out depending on position and height of the container or hitch. Upper clamp comes down to complete the grip.

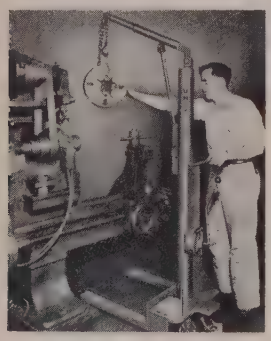
The tractor is made with 12 or 18-v battery; overall dimensions are 27 x 48 inches. Draw bar pull is about 700 pounds. Moto-Truc Co., Dept ST, 1959 E. 59th St., Cleveland 3, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 25

Boom, Fork, Platform Truck

. . . handles all shop jobs

This hydraulically-operated three-in-one shop truck handles all lifting jobs within its capacity, whether they require a boom, forks or platform. The boom lifts to 8 feet. Switching one pin is all that



is needed to put the forks into operation. The latter need only 3¼-inch clearance and will lift a pallet to 55 inches.

To lift nonpalletized loads, platform can be locked over the forks. For handling in close quarters, the base is 22½ x 33-inches. Unit Mfg. Co., Dept. 154 ST, 1229 Harmon Pl., Minneapolis, Minn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 26

Improved Vitrified Bond

. . . keeps wheels at peak

Abrasive grinding wheel grains are held until the proper point, then released to make room for new, sharp cutting edges by this improved VG vitrified bond. Result is continued peak efficiency of grinding surface. The bond can be used in conjunction with a wide variety of abrasive types. Norton Co., Dept. ST, Worcester 6, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 27

How to Reduce "LOST-BUT-PAID-FOR" HOURS

Shut down of a machine for tool change does not shut off operating expense. Production stops, but costs run on.

There's a way to minimize this non-productive time . . . Kennametal tools seldom need replacement — hours on the machine, minutes being reground.

Kennametal is "different" — ingredients, compositions, processing. The resultant distinctive characteristics are utilized to a maximum degree in novel tool designs — especially the clamped-on technique — in which we pioneered.

How Kennametal reduces Lost-but-Paid-for-Hours is disclosed by case studies in periodically-issued Performance Reports, and can be demonstrated in your own plant. Such information and help is yours for the asking. Kennametal Inc., Latrobe, Pa.

KENNAMETAL
CEMENTED CARBIDE TOOLING THAT INCREASES PRODUCTIVITY

CALENDAR
OF MEETINGS

April 26-30, American Ceramic Society: Annual meeting, Hotel Statler, New York. Society address: 2525 N. High St., Columbus 2, O. Secretary: Charles S. Pearce.

April 27-28, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: E. V. Gent.

April 27-28, Galvanizers Committee, American Zinc Institute: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary-Treasurer: E. V. Gent.

April 27-28, Independent Petroleum Association of America: Midyear meeting, St. Louis. Association address: Box 1019, Tulsa, Okla. President: Charlton H. Lyons.

April 27-28, Copper & Brass Research Association: Annual meeting, Drake hotel, Chicago. Association address: 1420 New York Ave. NW, Washington 5. Corresponding secretary: Mrs. Elizabeth Dyer.

April 27-May 2, Concrete Reinforcing Steel Institute: Annual spring meeting, The Carolina, Pinehurst, N. Carolina. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

April 27-May 8, British Industries Fair: Castle Bromwich, Birmingham, and Earls Court, London, Eng. Information: Larry Nixon, 575 Madison Ave., New York 22.

April 28-30, American Society of Mechanical Engineers: Spring meeting, Deshler-Wallick hotel, Columbus, O. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

April 29-May 1, Boston Section, American Institute of Electrical Engineers: Northeastern district meeting, Hotel Sheraton Plaza, Boston. Institute address: 33 W 39th St., New York.

April 29-May 1, Radio-Television Manufacturers Association: Electronic components symposium, Shakespeare Club, Pasadena, Calif. Information: Suite 1011, 621 S. Hope St., Los Angeles 17.

May 3-7, Liquefied Petroleum Gas Association: Annual meeting and exhibit, Hotel Conrad Hilton, Chicago. Association address: 11 S. LaSalle St., Chicago 3. Secretary: Arthur C. Kreutzer.

May 4-6, National Small Businessmen's Association: Annual meeting, Hotel Mayflower, Washington. Association address: Evanston, Ill. Vice president: A. W. Kimball.

May 4-6, Automotive Engine Rebuilders Association: Annual spring meeting, Netherland Plaza hotel, Cincinnati. Association address: 419 N. Capitol Ave., Indianapolis. Executive vice president: R. G. Patterson.

May 4-8, American Foundrymen's Society: Annual meeting, Chicago. Society address: 616 S. Michigan Ave., Chicago 5. Secretary: W. W. Maloney.

May 6-7, National Metal Trades Association: Mid-Atlantic assembly, Bellevue-Stratford hotel, Philadelphia. Association address: 549 W. Randolph St., Chicago. Secretary: Louie W. Silvis.

May 6-8, American Society of Training Directors: Annual meeting, Sheraton Plaza hotel, Boston. Society address: 2020 University Ave., Madison 5, Wis. Secretary: Russell L. Moberly.

May 6-8, Porcelain Enamel Institute: Mid-year divisional meetings, Edgewater Beach hotel, Chicago. Institute address: 1346 Connecticut Ave. NW, Washington 6. Secretary: John C. Oliver.

May 7-8, The Wire Association: Regional meeting, Mt. Royal hotel, Montreal. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

May 7-8, Industrial Fasteners Institute: Annual meeting, Westchester Country Club, Rye, N. Y. Institute address: 3648 Euclid Ave., Cleveland. Secretary: James D. Eggers.

May 8, American Society for Metals: New England regional meeting, Hotel Bond, Hartford, Conn. Information: Walter E. Borin, Underwood Corp., Hartford 6, Conn.

May 11-13, Rail Steel Bar Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 38 S. Dearborn St., Chicago 3. Secretary: W. H. Jacobs.

May 11-14, American Mining Congress: Annual meeting and exposition, Public Auditorium, Cleveland. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

May 14, Conference, Instrumentation in Water, Sewage and Industrial Waste Treatment: Manhattan College, New York. Information: Joseph McCabe, Civil Engineering Dept., Manhattan College.

May 14-15, National Association of Sheet Metal Distributors: Spring meeting, Deshler-Wallick hotel, Columbus, O. Association address: 1900 Arch St., Philadelphia 3. Secretary: Thomas A. Fernley Jr.

May 14-16, American Coal Sales Association: Annual spring meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 1625 Eye St. NW, Washington. Executive vice president: W. W. Bayfield.

May 14-16, American Institute of Mining & Metallurgical Engineers: Pacific Northwest metals and minerals conference, Hotel Benjamin Franklin, Seattle. Institute address: 29 W. 39th St., New York 18.

May 18-19, National Fluid Power Association: Organization meeting, Bedford Springs hotel, Bedford Springs, Pa. Association address: 1618 Orrington Ave., Evanston, Ill. Temporary executive secretary: Barrett Rogers.

May 18-19, Association of Iron & Steel Engineers: Spring meeting, Hotel Statler, Buffalo, N. Y. Association address: 1010 Empire Bldg., Pittsburgh. Secretary: T. J. Ess.

May 18-20, Industrial Furnace Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York.

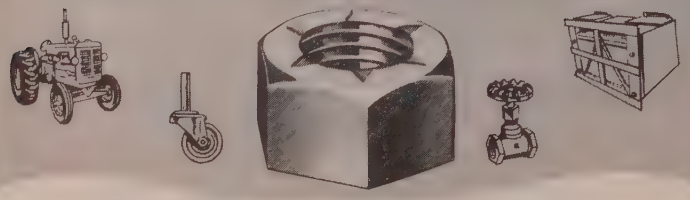
May 18-22, Material Handling Conference and Exposition: Convention Hall, Philadelphia. Information: Banner & Greif, 250 W. 57th St., New York 19.

for ECONOMY
for EFFICIENCY
GRIPCO
LOCK NUTS

on FIRST cost
Simplified design makes possible much lower price

on APPLICATION cost
Fast Application cuts production time — and cost

DUPLICATE THE SAVINGS OF THESE GRIPCO USERS

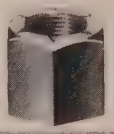


One reason for Gripco Lock Nut Economy is that the locking action is inherent in the nut itself, and is produced by vertical thread deflection. No inserts, outside devices or extra height are required. Because of this simplicity, we can sell an efficient lock nut at a much lower price. Because Gripco Lock Nuts are made to standard semi-finished, full and jam, dimensions, and eliminate the need for a lock washer, shorter bolts can be used. Write for samples and descriptive bulletin. Another reason for Economy is speed in applying. Gripco Lock Nuts are started on the bolt like a common nut; then locked with a wrench.

MAKE SIMILAR SAVINGS ON ALL GRIPCO NUTS

NEW
GRIPCO
"CLINCH NUTS"
Hexagon shaped pilot fits snugly into hexagon hole punched into metal. Pilot is then flattened out under pressure, clinching the nut permanently.

GRIPCO
HI-NUTS
50% greater thread height and thread strength than standard size nuts, but Economy-priced. Used as Leaf-Spring Fasteners on trucks, trailers, buses, cars, etc.



GRIPCO
PILOT-PROJECTION
LOCKING WELD NUTS
Circular pilot accurately positions nut over bolt hole, for instant resistance welding. No jigs required. Another time and money-saver.

GRIPCO
COUNTERSINK
LOCKING WELD NUTS
Gripco exclusive countersink feature increases distance between threads and welding projections, resulting in cooling and solidification of any weld spatter before it contacts threads.

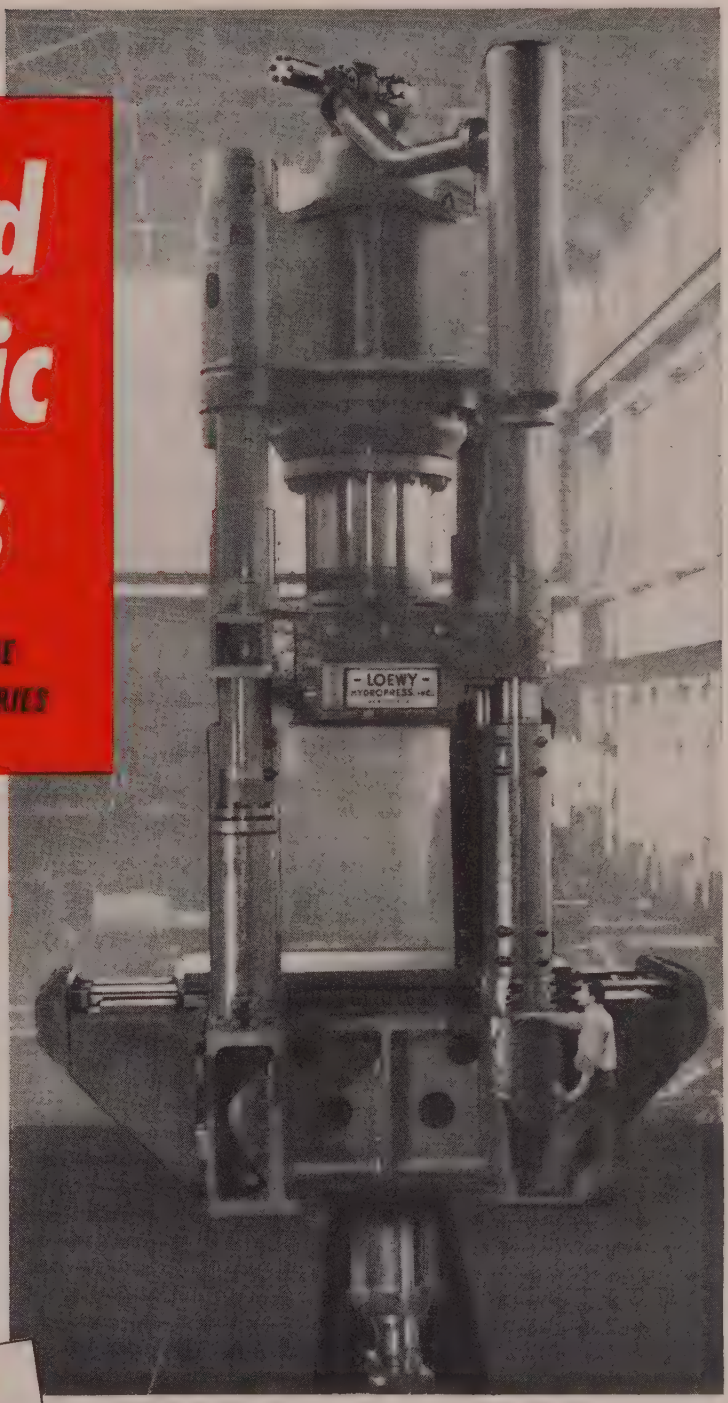
Write for samples, mentioning types and sizes of nuts you use.

256S

GRIP NUT COMPANY
308-N S. Michigan Ave., Chicago 4, Ill.

We Build Hydraulic Presses

AND POWER SYSTEMS FOR THE STEEL AND NON-FERROUS INDUSTRIES



- Forging and Die Forging Plants
- Deep Drawing Single and Double Acting Presses
- Extrusion Plants For Steel and Non-Ferrous Metals
- Hot and Cold Rolling Mills and Auxiliary Machinery
- Die Casting Machines for Aluminum and Brass

4,000 TON HYDRAULIC PRESS FOR CLOSED DIE FORGING OF ALLOY STEEL

With hydraulically operated Shifting Tables in Slide and Bed and Hydraulic Ejector

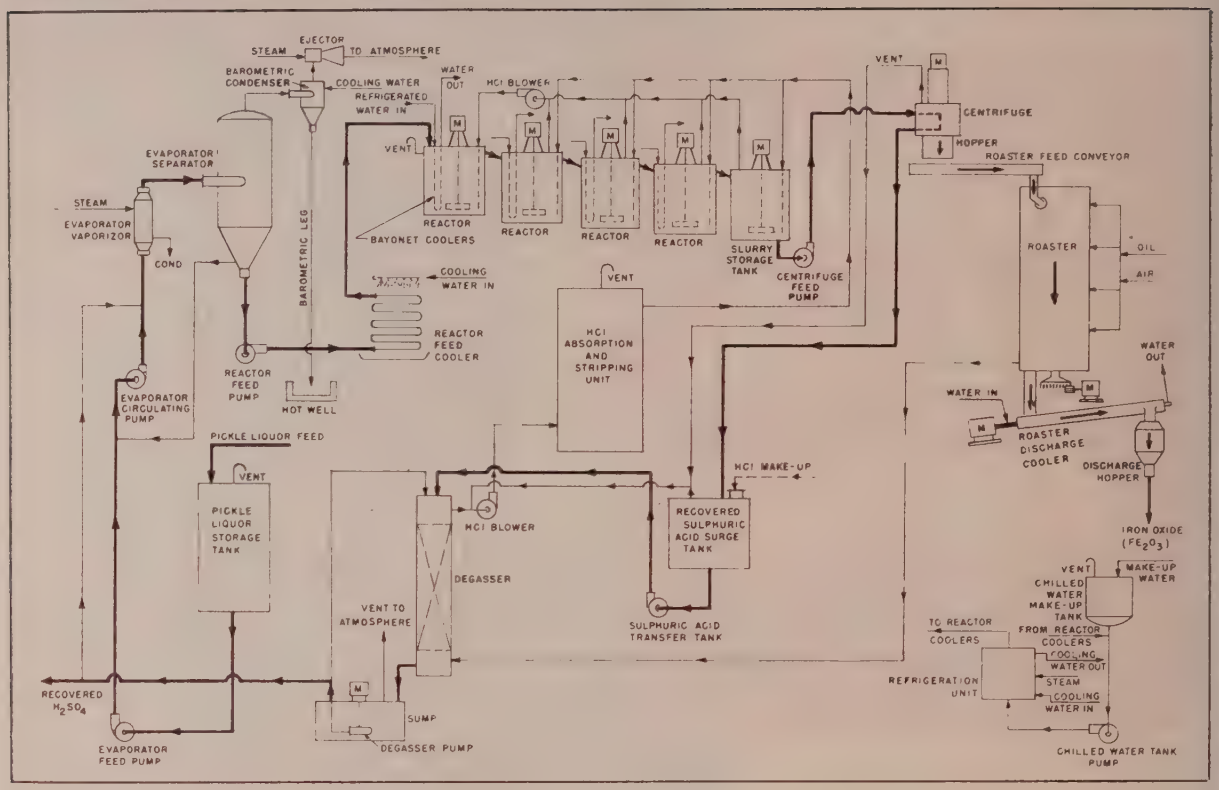
LOEWY HYDROPRESS INC.

ENGINEERS • CONTRACTORS

Birmingham • Chicago • Cleveland • Detroit • Los Angeles • Phoenix • San Francisco
Seattle • Washington, D. C. • Wheeling
Genoa, Italy • London, England • Madrid, Spain • Paris, France • Philippine Islands

Rolling Mills • Hydraulic Presses • Pipe Testing Machines • Special Pipe Mill Equipment • Accumulators • Pumps • Die Casting Machines

350-A Fifth Avenue, NEW YORK 1, N. Y.



Reuse Waste Pickling Liquors

By DR. ALLEN G. GRAY
Technical Editor

Waste pickle liquors are regenerated with hydrogen chloride which is recycled. No undesirable byproducts are left. Process gives new hope to an old problem

PERENNIAL HEADACHE of the metallurgical industries for many years has been what to do with waste pickling liquors. Many answers have been suggested. Until recently, steelmakers agreed that no practical solution was in sight.

Failure to obtain an answer to this knotty disposal problem certainly is not due to lack of diligence on the part of those who face it. A great deal of time and money has been spent. Many processes which have been proposed or which are now in use do not in themselves provide a suitable answer.

Something New — Steel men perked up their ears last month when Blaw-Knox Co. announced a new process to recover the entire sulphate equivalent of waste pickle liquor as reusable sulphuric acid. Furthermore, it is done without producing other undesirable byproducts which themselves might pose a disposal problem. Iron in the pickle solution is recovered as essentially pure iron oxide, which is recharged to the furnaces. Invented by Dr. Othmar Ruthner of Vienna, the new process was adapted to American engineering standards by Blaw-Knox.

Waste pickle liquor consists of a solution of ferrous sulphate and sulphuric acid which results when sulphuric acid is used to remove surface oxides from steel in conventional pickling operations. The actual concentration of acid may vary from 1 to 10 per cent by weight, with ferrous sulphate varying from 2 to 25 per cent. According to U. S. Steel Co., a fairly representative pickle liquor waste contains 5 per cent acid and 17 per cent ferrous sulphate.

Plenty Around—As to the magnitude of the disposal problem, it is estimated that within the U. S. more than 500,000 tons of 60 degree Be′ sulphuric acid are used for pickling in a normal year. This use results in the production of more than 600 million gallons of waste liquor — equivalent to 700 tank car trains, each a mile long.

Dissolution of the scale and attack of the iron base results in depletion of the pickle acid and accumulation of iron salts in the bath. For this reason, the pickling solution eventually loses its effectiveness and must be discarded. About 20 per cent of all carbon steel produced is pickled at some stage in the production of finished products.

Present Way—Neutralization of

Report on B&W Allmul Firebrick

IN SEVERE SERVICE APPLICATIONS

SERVICE	RESULTS
End wall of side discharge billet heating furnace used for heating crankshaft billets	B&W Allmul gave twice the life—cost about the same as previous refractory
Severe service areas in billet heating furnace	B&W Allmul gave equal life—cost half as much as refractory previously used
Hottest areas of welding furnace used for butt welding pipe	B&W Allmul gave 6 times the life—cost about the same as refractory previously used
Complete lining in reverberatory furnace used to melt brass for plumbing fittings	B&W Allmul gave equal life—cost 30% less than special kyanite refractory previously used
Cupola-slagger of malleable duplexing operation	B&W Allmul lasted 6 times as long as super-duty firebrick
Reverberatory-type smelting furnaces used to melt alloys of lead, tin and antimony	Side-by-side tests with practically every type of refractory proved B&W Allmul was most economical
Uptake arches of two continuous weld pipe furnaces. One furnace handles pipe up to ¾", and the other up to 4½"	B&W Allmul lasted 3 times as long as kyanite refractory previously used
Complete linings of indirect arc furnaces melting various alloys with pouring temperatures from 2700 F to 3100 F	B&W Allmul lasted 2 to 3 times as long as previous refractory—and cost about the same
Roof of direct arc furnace which handles stainless steel—pouring temperature of 3100 F and higher	B&W Allmul lasted 3 times as long as super-duty brick

Here are nine performance records that prove the economy of B&W Allmul in severe service applications. • What's behind this remarkable, money-saving performance of B&W Allmul Firebrick? The answer lies in its low first cost for a fused mullite brick and unique combination of excellent refractory properties: High hot load strength, high resistance to spalling, good volume stability, a high melting point of 3335 F. Bulletin R-29 gives all the facts on Allmul. Write for your copy.

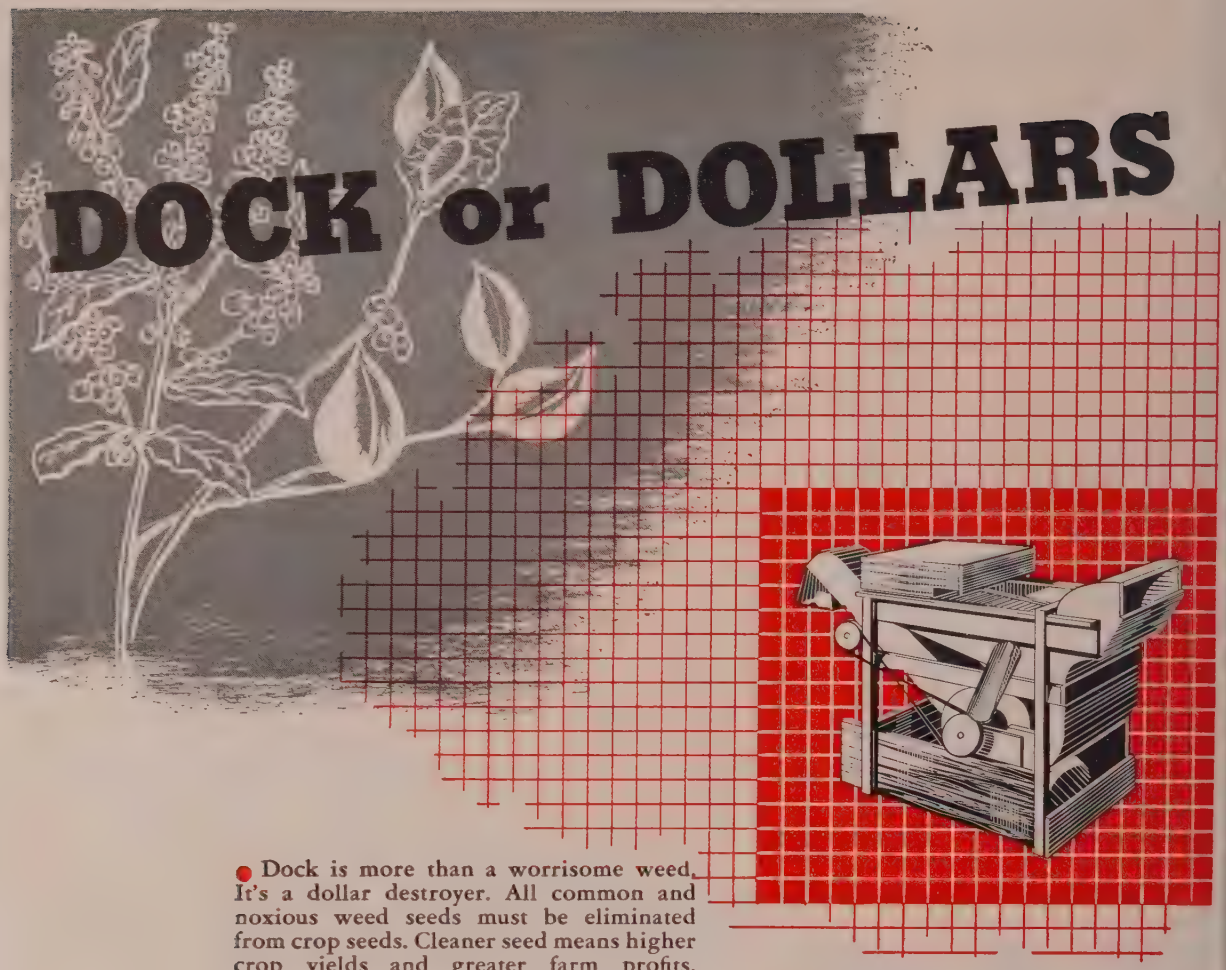
BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42ND ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

B&W REFRACTORIES PRODUCTS — B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars

R 467

DOCK or DOLLARS



● Dock is more than a worrisome weed. It's a dollar destroyer. All common and noxious weed seeds must be eliminated from crop seeds. Cleaner seed means higher crop yields and greater farm profits. Again Reynolds Wire Screen Cloth is the farmers' friend!

In fanning mills . . . used by certified seedsmen and farmers . . . Reynolds Wire Cloth insures positive, selective separation in cleaning field, garden and flower seeds, grain, beans, etc.

Over 200 sizes of wire cloth are carried in stock by the maker of this fanning mill for cleaning and separating seeds.

The "screen shoes" in a fanning mill are really sieves for sifting and sizing. In a two-shoe series, the bottom one is wire cloth. Each type of seed or grain, differing ever so slightly, demands its own special mesh. That means many, many sizes of wire cloth, each with a weave and mesh accurate to the 'Nth degree.

But, Reynolds precision processing extends to wire diameters, metals or alloys, temper, workability, weight, wear, finish—to meet industry's individual needs, strictly to specifications. Consult Reynolds Engineers. No cost or obligation.

Reynolds WIRE CLOTH protects performance

REYNOLDS WIRE DIVISION, NATIONAL-STANDARD CO., **DIXON, ILLINOIS**

Divisions of National-Standard Co.

ATHENIA STEEL...*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD...*Niles, Mich.*	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY...*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS...*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

NS NATIONAL-STANDARD Company NILES, MICHIGAN

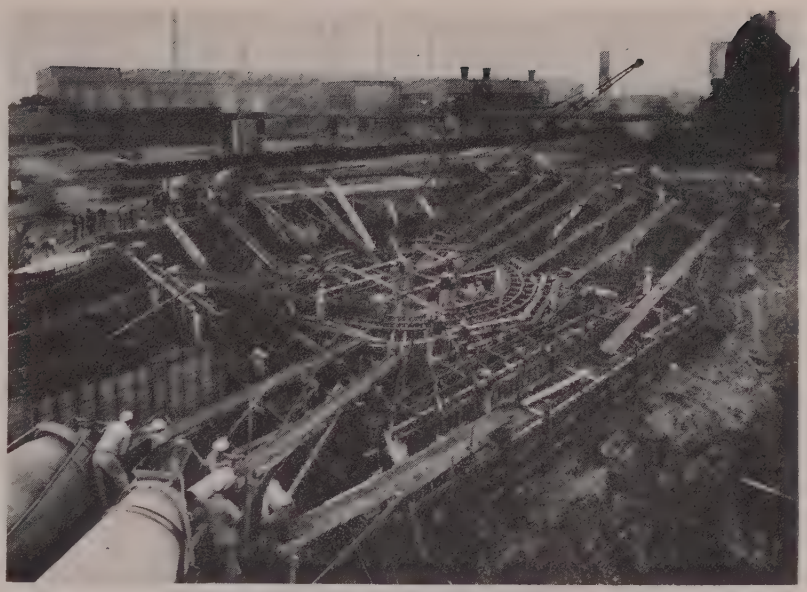
the waste pickle liquor with the cheapest available alkali is the most extensively used method of disposal. To get rid of a ton of equivalent acid by this method, costs nearly as much as did the purchase of the original ton. Major attention has been given to the neutralization method because in most instances there is no other alternative.

Principal difficulty outside of the cost of this treatment method is in the disposal of the sludge. Generally it is discharged into lagoons, where dewatering takes place by percolation through the soil and by evaporation. The sludge dewaters so slowly that large disposal areas are required. In many cases such areas are not available.

Does the Job—Here's how the new treatment method works. The spent liquor is concentrated by evaporation. The ferrous sulphate is then converted into ferrous chloride by absorption of hydrogen chloride. The ferrous chloride precipitates and is removed from the spent pickle solution by centrifugation. The hydrogen chloride in reacting with the ferrous sulphate in the liquor generates an equivalent quantity of sulphuric acid — the same material that was used to make up the pickle solution in the first place.

This regenerated pickle solution is then returned without further processing to the pickling line. The ferrous chloride which was removed in the previous step is roasted to produce hydrogen chloride. This is recycled to the process. Thus the essential chemical required for the waste treatment process is used over and over again. The iron oxide which remains after the calcining step can be charged into the furnaces around the mill.

Here's How—Flow sheet shows waste pickle liquor going into storage tank from where it is pumped to a steam heated evaporator to concentrate the ferrous sulphate-sulphuric acid solution. The concentrated waste solution is then pumped through water cooling coils into the cooled reactor tank, where hydrogen chloride from the roasting operation is blown in. The treated waste containing precipitated ferrous chloride then goes to the slurry storage tank which feeds a centrifuge. Solid ferrous chloride is separated from the regenerated pickle solution. It goes to the roaster. Heating gives back the hydrogen chloride previously used and leaves a residue of iron oxide. The liquid leaving the centrifuge goes into sulphuric acid recovery tank and is ready to be reused in the pickle line.



Twelve-Hour Furnace Foundation Pour

Kaiser Engineers Division completed a 2321 cubic yard foundation pour in 12 hours and 3 minutes for a third blast furnace—a part of Kaiser Steel Corp.'s $65 million Fontana, Calif., plant expansion program. The entire monolithic volume was placed by 20 chutes, without mechanical pouring equipment. Six electric and pneumatic vibrators controlled flow and segregation within the pour

Strictly Business—Since appropriate treatment of pickle waste is often necessary to abate stream pollution, it is important to recognize that treatment expense is an actual operating cost, and must be treated in the same manner as raw material, power and labor costs. A significant aspect of the new treatment process is that the chemical required is used over and over, and the waste is regenerated for reuse. Blaw-Knox estimates that facilities to process spent pickle liquor in a steel plant using 10,000 tons of sulphuric acid per year would cost about $500,000.

Regardless of the treatment scheme used, however, there should be no letup in the methods used to minimize the quantity of waste to be processed. In batch pickling, the liquor should not be discarded until it is fully spent. In addition to reducing waste this will also reduce quantity of acid required for pickling. Such liquor may contain as little as 0.5 per cent up to 2 per cent free acid and 18 to 22 per cent ferrous sulphate.

In continuous pickling, the time of passage of the strip through the bath is such that total pickling time may be less than 30 seconds. This requires a higher acid content to remove scale. The composition of this waste liquor from a continuous pickler will generally fall in the range of 5 to 8 per cent free acid and 14 to 16 per cent ferrous sulphate.

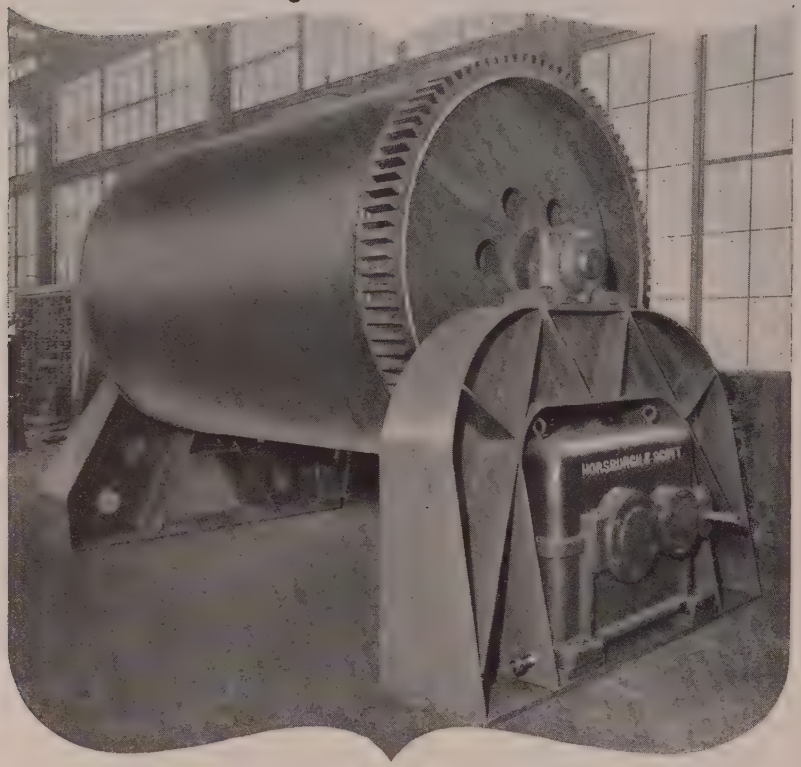
In dealing with pickle liquor treatment as in any other plant process, the operating cost is reduced by minimizing the volume of liquid to be handled. The quantity of water involved should be kept in hand, consistent with product quality.

If the conditions are such that rinse waters require treatment they should be held to smallest possible volume. This can be done by careful control, more efficient rinsing, and the use of rinse water to make up fresh baths.

H & S SPEED REDUCERS

save maintenance and space with

Greater safety



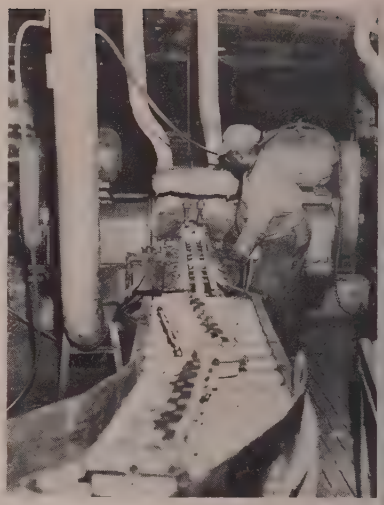
• Since 1940 the Horsburgh & Scott Herringbone Speed Reducer illustrated above...driving an Epworth Manufacturing Company Ball Mill in a large paint manufacturing plant... has been in operation with *no* repairs necessary. The service is severe with heavy starting load and the machine operates continuously for periods of 24 to 72 hours. As compared with the old drives the results are: greatly reduced maintenance and space... greater safety is also an important feature. H & S Speed Reducers offer many savings and advantages throughout the range of industry...it will pay you to investigate.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U. S. A.

Send note on Company Letterhead for Speed Reducer Catalog 46



Rough Grind: 1600 a Day

One man and a double-spindle dry grinder keep up with production line demands in this setup for processing cylinder head castings. Castings are conveyed directly to power-driven feeding fixture to remove rough metal fins at a rate of about 1600 units a day. Heads are then fed automatically through the grinder, a product of Besly-Welles Corp., Beloit, Wis.

Refractory-Cutting Arc

An 8000°F torch functions without other equipment to cut nonconductive material

PROCESS for cutting and piercing stone, cement, concrete and refractory materials establishes use of an arc rod upon nonconductive material without a ground connection. The process, trade named DynArc, is a development of Eutectic Welding Alloys Corp., Flushing, N. Y.

The self-energizing arc rod creates its own arc. It requires no ground and does not have to be struck upon metal. According to the company, the operator has complete control at all times, determining completely when and where the arc will start. Another departure from the conventional is the arc's capacity to operate in midair as well as upon stone, taking on characteristics of a 5 to 8-inch-long torch flame.

Tube of Coating—The heavy coating, formulated to produce thermo chemical interaction with the arc stream that reacts with nonmetallic material, is reduced

Ford Motor Company chooses

YALE*

MATERIALS HANDLING EQUIPMENT

*Registered Trade Mark

Yale & Towne Manufacturing Company, Philadelphia 15, Pa.

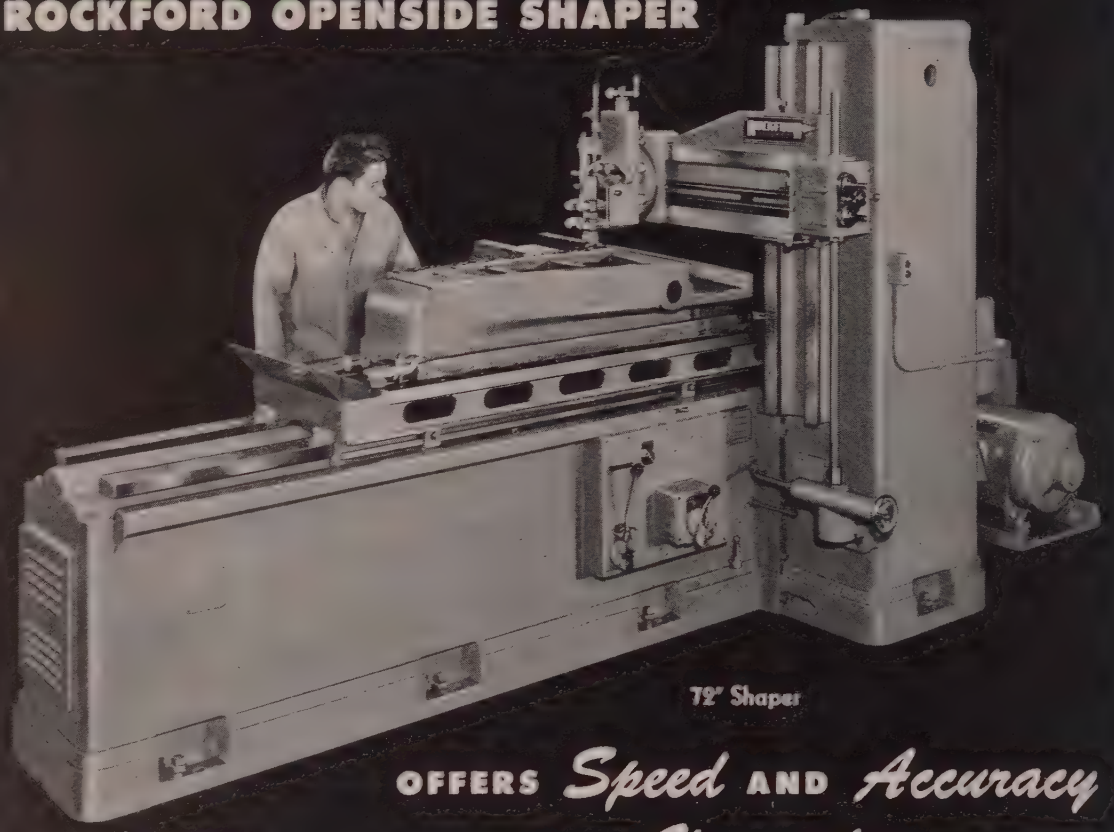
• Just as the Ford Motor Company's slogan is "Ford's Out Front!", so, too, Ford is out front when it comes to maintaining a high degree of efficiency in its manufacturing operations. In keeping with this slogan and with the exacting demands made on all operating equipment in the plant, Ford has specified YALE Electric Trucks as one of the production tools for the mammoth new Ford foundry located in Cleveland, Ohio.

When the Ford Motor Company chose YALE trucks, they knew that it would result in lightening the burden of workers . . . hasten output . . . and cut down on operating costs! It is this kind of confidence in the endurance and reliability of YALE trucks as shown by Ford—in common with other leading manufacturers—that leads users of materials handling equipment, from giant Ram Trucks to compact Worksavers, to rely on dependable YALE industrial Lift Trucks and Hoists.

Gas, Electric, Diesel Lift Trucks • *Worksavers* • Hand Trucks • Hand and Electric Hoists • Pul-Lifts

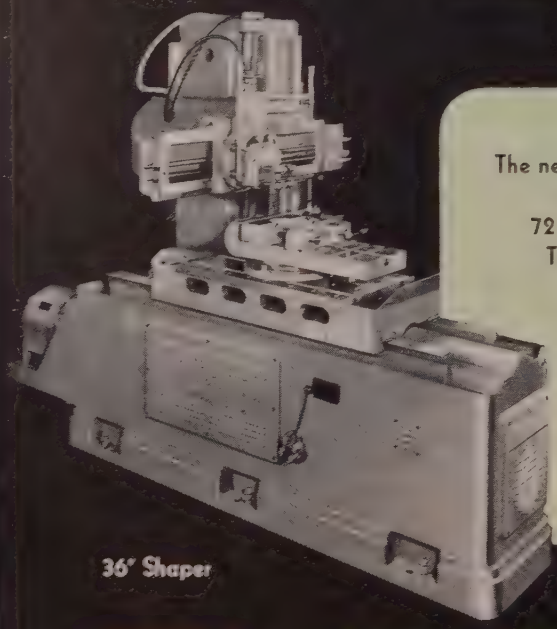
NEW.....

ROCKFORD OPENSIDE SHAPER



72" Shaper

OFFERS *Speed* AND *Accuracy* PLUS *Versatility*



36" Shaper

The new 72" Rockford Openside Shaper gives you *best* results on *all* shaper jobs — with stroke lengths up to 72 inches.

This "big brother" of the Rockford Openside Shaper family (36", 48", 60", 72") has all the superior features of companion models, *plus* increased capacity. It's the maximum in versatility — large-job capacity with no sacrifice in speed or accuracy. And it's *Hydraulic* . . . of course.

Before you invest, investigate the new 72" Rockford Openside.

Hy-Draulic

ROCKFORD MACHINE TOOL CO.

2500 Kishwaukee Street • Rockford, Illinois

more slowly than the core. This forms a crucible or tube of coating through which energy is concentrated into a fine tip. Thermal ionization of the coating by the arc stream, combined with concentration, produces conditions necessary to pierce and melt refractory material.

The company says its process is applicable wherever a direct current welder with 400 or more amp capacity is available. Reports on a recent demonstration show an absence of the multiplicity of equipment associated with high temperature and pneumatic cutting and drilling. No compressors, air lines, oxygen tanks, pneumatic drills, etc., were necessary. A conventional welder and a supply of the manufacturer's DynaTrode rods comprised the equipment.

Applications Appear—Several application possibilities are presented. When equipment has to be installed, the time-consuming concrete hole drilling job is eliminated. According to the company, the arc rod pierces solid concrete in seconds.

Pipes buried in concrete present a problem when they require attention that is simplified by this versatile electrode. Masonry can be pierced quickly and pipe exposed.

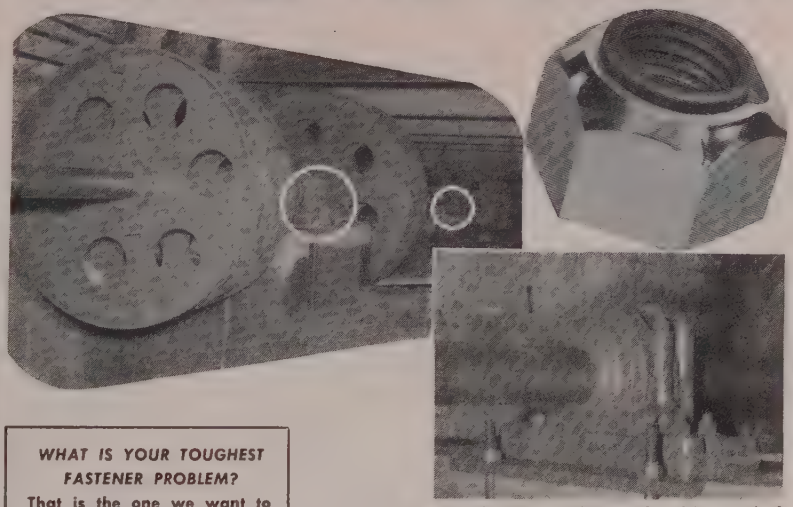
MIT Reports Summer Sessions

Plans for two special summer programs, on feedback control systems and physical metallurgy, are announced by Massachusetts Institute of Technology. The first, fundamentals of physical metallurgy, is scheduled June 16-26 and is planned as an educational course rather than a research conference, according to Dr. Ernest H. Huntress, summer session director. The second program will present a formalized theory for analysis and synthesis of feedback control systems from June 22 to July 4.

Wire Facilities Expand

Drawalloy Corp. has expanded operations and manufacturing facilities with enlarged quarters at York, Pa., where the firm established a new wire mill for producing stainless, tool steel and special alloy wire for the welding industry. The line includes stainless wire for all types of automatic welding.

HOW TO KEEP A SHAFT WHERE YOU WANT IT!



PERHAPS you have a problem like this—a shaft that wants to whip the bearings right off the pedestal!

Keeping the line shafts from shaking the pillar block hold down nuts off was a problem for the Publishers Paper Company of Oregon City, Oregon, until they found out about "Security". Now the shafts stay "put"!

Not only do Security Locknuts keep the line shafts in place but they serve to cut down service time and reduce wear wherever vibration gives trouble in the mill. Security Locknuts can stop *your* vibration troubles, too.

There is no other locknut like Security and no other locknut will do what a Security will do. Security Locknuts are self-locking in any position. They do not require bolt tension to keep them tight. They stay where you wrench them, even in the face of vibration that *destroys* the bolt. A Security Nut can be removed and replaced any number of times without materially loosing the torque or locking power and without injury to the bolt. This means easy maintenance for your customer's customer. Installation is fast—nothing to line up—no extra parts—nothing to shear!

Authoritative tests have proved conclusively the gripping power of Security Locknuts. We would like to have you see the reports on these tests. Security Locknuts are made in 3/8" to 3" bolt sizes.

Fill in the coupon for more details.

THE SECURITY STUDLOC

The photo diagram, left, shows a cross section of the Security Locknut. The Locking Insert grips the bolt with the terrific tension that only the best of spring steels could exert. Simple, dependable, positive.

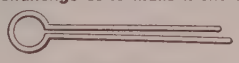
THE SECURITY CAPLOC

—a cap nut that locks — costs no more than an acorn nut, stays tight and protects bolt ends from corrosion.

WHAT IS YOUR TOUGHEST FASTENER PROBLEM?

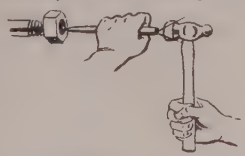
That is the one we want to help you on. Security fastener experts have a long range of experience in problems where other fasteners would not hold.

Challenge us to make it stick!



ARE YOU COTTER CONSCIOUS?

There may be places where cotters are the only solution but cotters are expensive to install. Security Locknuts eliminate the adjustment of expensive castellated nuts, drilling and weakening bolts and setting cotters. You install Security like an ordinary nut.



WHY DESTROY THE BOLT?

Battered up bolt ends mean tough maintenance for your customer. Why peen bolt ends when you can lock the part in place in half the time and still permit easy removal.

ONE NUT DOES IT!

With Security it takes only one nut to hold the job. Just put it on like an ordinary nut. The Security retainer holds it in place and the nut body takes the load. Ask for more complete details. Let us tell you how it's made.

SECURITY LOCKNUT CORPORATION
1504 North Ave., Melrose Park, Ill.
Please send me without obligation:
☐ One of your Thread Tolerance Charts.
☐ We have a fastener problem and would like to know more about Security Locknuts.

Company Name

Address

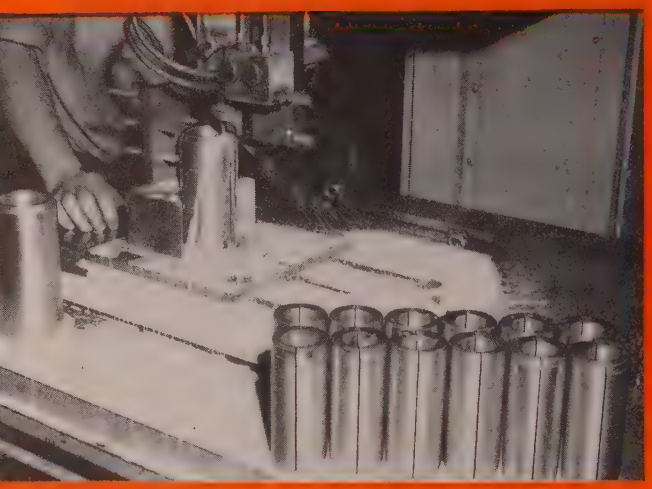
Town ..... Zone.... State

Signed

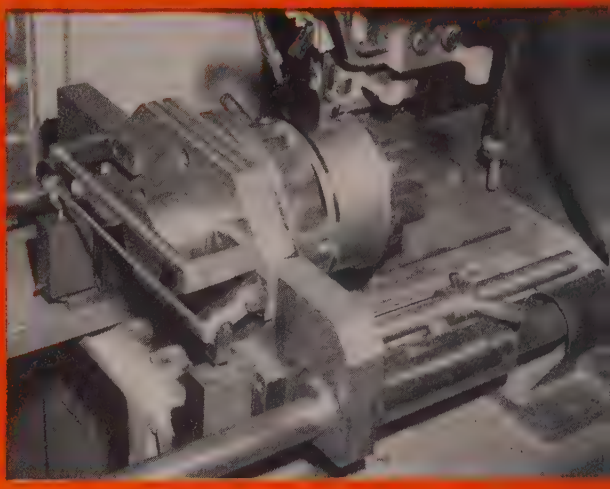
Security
The Nut You Can't Shake Loose

PRODUCTION

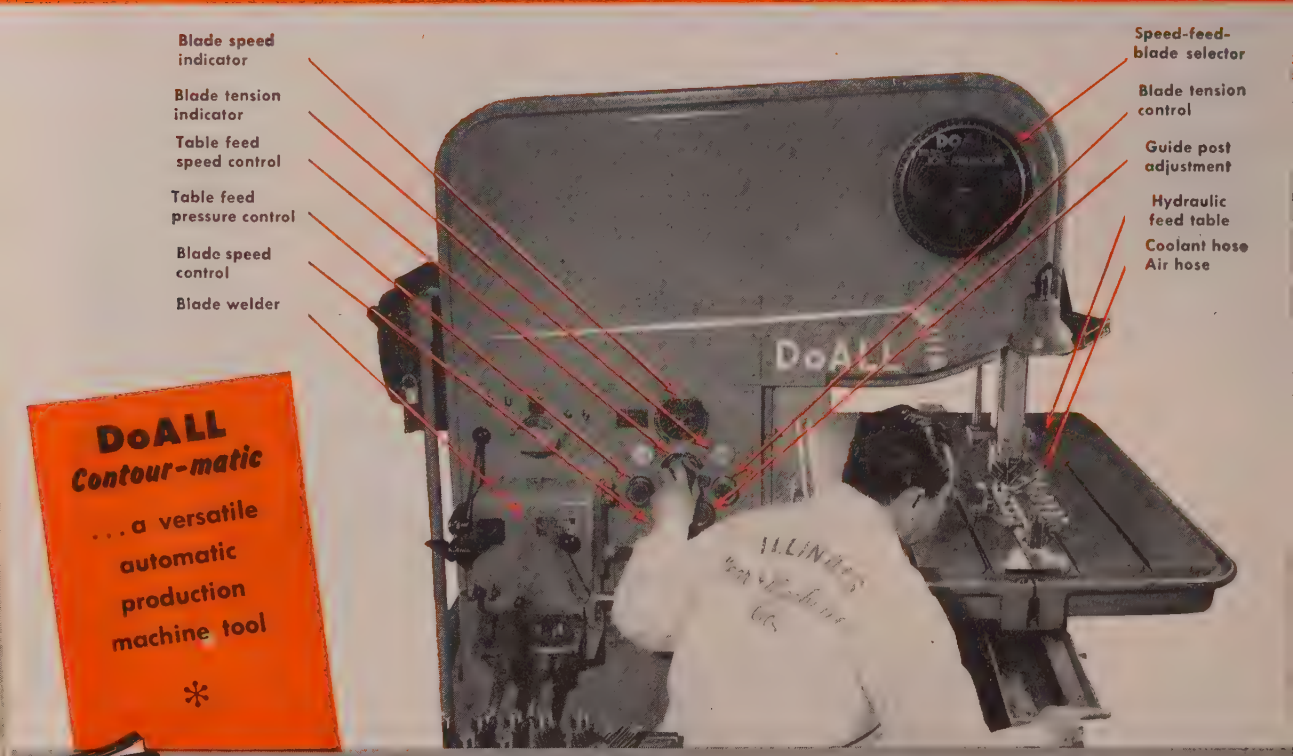
Low Cost Answer to Many Operation



SLOTTING Slotting bushings, using fixture and special heavy gage DoALL Saw Band to produce desired slot width.

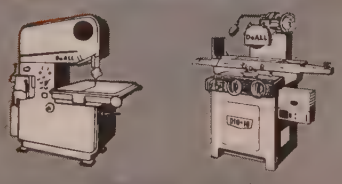


SLITTING Cutting heavy duty bearings in half. Adjustable fixture handles parts up to 11" dia. x 14" length.

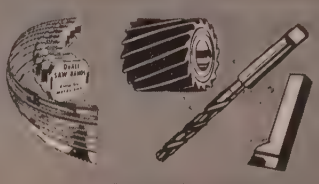


DoALL
Contour-matic
. . . a versatile automatic production machine tool

*



MACHINE TOOLS



CUTTING TOOLS

BANDSAWING

ion Runs of Identical Parts

ANGLE CUTTING Back-up bar is bolted to saw table. An angle is bolted to back-up bar. Fully adjustable.

STOCK REMOVAL Excess stock required to hold pinions in gear cutter being removed automatically.

Use of Simple Fixtures Often Lets Bandsawing Replace More Costly Machining Methods

HOW the use of simple fixtures bolted to DoALL power feed bandsaw tables extends the usefulness of the machines in mass production work can be seen from the accompanying illustrations. Many jobs that would otherwise be performed on slower, more expensive machine tools are now being done on DoALL machines because of the user's ingenuity in devising fixtures.

The versatility of the DoALL Contour-matic makes it the preferred machine for production sawing. Variable hydraulic table feed, automatic stop, adjustable pressure coolant flow, adjustable pressure air flow to blow chips away from cut, blade speed range from 10 to 40,000 fpm, band tension control—these are a few of the features of this production machine.

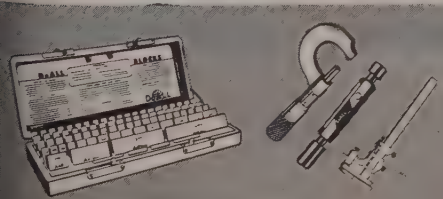
To take advantage of the production economies possible with band machining, call your local DoALL Store, or write:

The DoALL Company
254 N. Laurel Ave., Des Plaines, Ill.

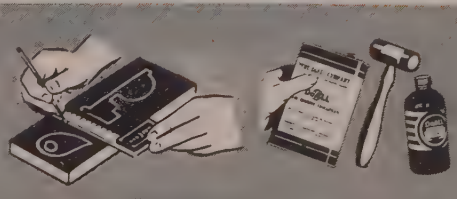
38 Sales-Service Stores to Serve You—See Your Phone Directory

DoALL

B-18



GAGING EQUIPMENT



INDUSTRIAL SUPPLIES

Rotary slitter cuts standard sheets to size for expansion machine making diamond mesh metal lath

Modern Construction Uses Old Idea

Although the basic patent for expanded metal lath dates back more than a century it takes modern equipment and skills to produce it for current requirements

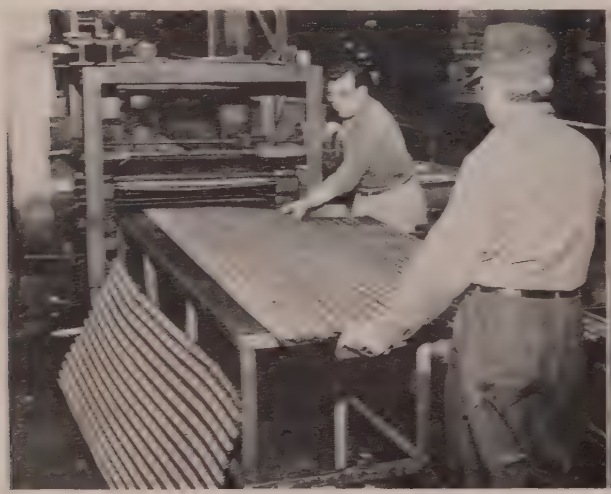
MODERN construction requirements provide the impetus to high production of metal lath, a product that dates back before the commercial development of steel. Modern production methods differ from the technique used by Peter Naylor in 1839 but the fire protection described in his patent is still a big selling point. Instead of the hand punch used by the inventor more than a hundred years ago, specialized machines form several types of metal lath today, each with a specific end use in mind.

Republic Steel Corp.'s Truscon Steel has a metal lath division located in Youngstown. Its operations include the making of the three most popular types of lath plus the accessories needed for construction.

Biggest Seller—Largest tonnage goes into diamond mesh lath with Truscon's monthly shipments averaging about 1200 tons against 400 tons each for flat rib and 3/8-inch rib lath. Most metal lath is made from copper alloy steel sheet although galvanized sheet is used in locations where salt air corrosion is a big factor or where local codes require it.

Sheets are received in flat form and slit to widths required. Diamond mesh lath is perforated and expanded from its original 9-inch width on a 45-degree angle machine to a standard size of 24 x 96 or 27 x 96 inches after trimming. Constant finished size gives about 2 square yards per sheet.

Skill Needed—Slitting dies used in forming diamond lath are purchased from an outside die shop since their manufacture with 84 cutters on each shaft requires considerable skill. Die regrinding is required every 12 to 18 hours and is handled in Truscon's machine shop. It takes about one hour to



Following rolling operation used to flatten rib lath, sheets are counted and bundled before the paint dip. Added rigidity permits wider spacing of the supports

Expander and groover for cornerite used where walls meet or where the walls and ceilings meet and metal lath is not used throughout to give crack protection

Exit end of the diamond mesh expansion machine. Slitting and expanding are a one-step continuous operation

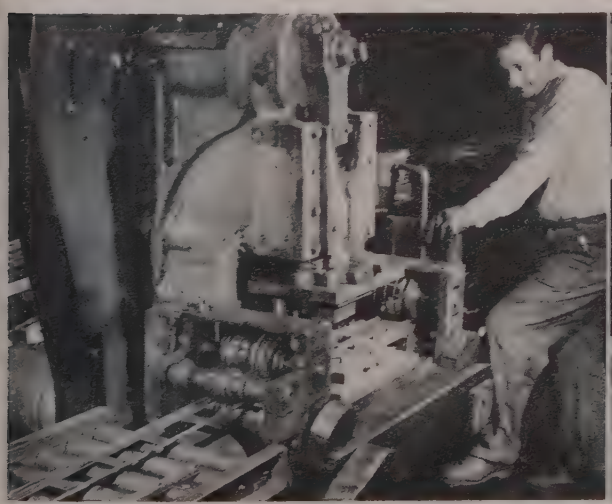
Rib lath slit on a separate punch cutter is placed in an expander. Metal jaws grip the sheet and expand it

change rolls for regrinding and a duplicate set of rolls is kept on hand to keep production machinery on the line as much of the time as possible.

Although copper alloy sheet is used because it has a higher resistance to corrosion than the ordinary carbon grades of steel, further protection is given to the finished product by a dip coating of asphalt paint. Finished lath is made in these weights: 2.5, 2.75, 3.4 and 4.0 pounds per square yard. Formerly additional sizes were manufactured but standardization through the U. S. Department of Commerce since the war simplified inventory and reduced floor space requirements both in manufacturing and storage.

Punch Cutter Used — Flat rib lath is so designated because of the angle of the shallow rib. The cutter problem makes it necessary to use a punch cutter similar in appearance to a conventional punch press instead of the unit using a rotary cutter. Speed of the ram is built into the machine and is not governed by the operator. Width of sheet used is 14 inches. Similar procedure is used for making ⅜-inch rib lath with the major differences being in die design and in the original sheet width of 13.5 inches. Finished sheets are 24 inches wide.

Corner bead is fabricated in several varieties from galvanized steel sheets with either perforated or expanded wings. After the holes are punched the sections are put through small rolling machines to form the bead. Starting with 26 gage sheet, corner bead is made up in 7, 8, 9, 10 and 12-foot lengths and in five different widths. A total of 34 different types and lengths of corner bead are produced as standard items.



Hollow partition studs are rolled and cut off in a single operation. Punched out centers permit passage of piping and wiring in addition to reducing weight

Perforated corner bead is packed for shipment as it comes out of punch press and forming roller. It is fabricated in several varieties from galvanized steel

Westinghouse Closes In

Sending of a transcontinental message from the Boston to the San Francisco office of Westinghouse Electric Corp. recently opened one of the largest intracompany teletype relay systems in the nation.

The system, located in the company's Gateway Center headquarters offices, Pittsburgh, will be capable of receiving 33 messages at one time.

This modern equipment replaces an old teletype relay system operated in the E. Pittsburgh plant and permits expansion of the teletype network from a total of 98 sending and receiving stations to about 150 by mid-1953.

According to figures compiled by American Telephone & Telegraph Co., the headquarters teletype station is the largest manual tape relay station in the world. Equipment was manufactured by Teletype Corp. and installed by Western Electric Co., both AT & T subsidiaries.

GLOBE

Specialization gives you "Tops in Quality"

ALLOY STEEL TUBES

SEAMLESS—MECHANICAL—PRESSURE—CORROSION-RESISTANT

TYPICAL ANALYSES:

Carbon	5 Chrome ½ Moly
Carbon ½ Moly	7 Chrome ½ Moly
½ Chrome ½ Moly	8 Chrome ½ Moly
1 Chrome ½ Moly	8 Chrome 1 Moly
1¼ Chrome ½ Moly	9 Chrome 1 Moly
2 Chrome ½ Moly	3% Nickel 7% Nickel
2¼ Chrome 1 Moly	5% Nickel 9% Nickel

AISI Types: 304-321-347-316-309-310-405-410-430-443-446

Analyses to meet conditions where heat, corrosion, pressure and structural strength are involved.

SIZE RANGE—WALL THICKNESS: ½ to 6 inches O.D. — wall thickness .035 to 1.000 inch.

TYPICAL APPLICATIONS: Pressure tubes — Superheater tubes — Condenser tubes — Still tubes — Evaporator tubes — Barrel tubes — Oil-well Pump Barrels — Mechanical tubes — Aircraft tubes — Propeller tubes — Rollers for Transmission Chains.

Globe engineers gladly give you the benefit of specialized knowledge of stainless steel tubing in a wide range of services and applications — to improve your product — to cut costs.

The heating, piercing, rolling of seamless tubes is controlled at every step for uniformity, close tolerance.

TO BE SURE... SPECIFY GLOBE

GLOBE TUBES

WHEN you specify Globe, you get uniform high quality alloy steel tubes, the product of highly developed production facilities and specialized quality controls and methods. All Globe tubes are thoroughly inspected and closely held within tolerance specifications. Write for the Globe general catalog.

GLOBE STEEL TUBES CO. MILWAUKEE 46, WISCONSIN

Chicago • Cleveland • Philadelphia • St. Louis • New York • Detroit
Denver • Houston • San Francisco • Glendale, Cal.

Producers of Globe seamless stainless steel tubes — Gloweld stainless steel tubes — alloy — carbon —seamless steel tubes — Globeiron (high purity ingot iron) seamless tubes — Globe Welding Fittings.

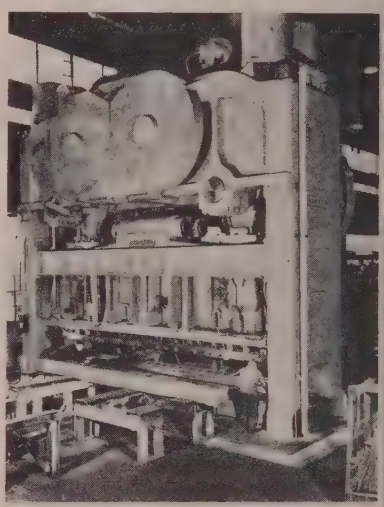
No Rail Distortion

Unitized cushions, absence of relative deflection in bed and slide eliminate camber

IMPORTANT requisite imposed by an automotive chassis frame manufacturer, in the market for a press for forming side rails, is sufficient weight. The reason: Less deflection in the bed and slide produced rails with less camber or bow.

To fill this specification, Midland Steel Products Co. recently placed in production at its Cleveland plant a side rail press they report is the largest of its type ever built. It weighs 1.8 million pounds.

If the bed and slide were engineered conventionally, added weight of the members could, in itself, reduce amount of deflection, according to Midland. But the builder, Baldwin - Lima - Hamilton Corp., introduced into the design a factor they call negative deflection. When loaded to 4000 tons—nominal pressure capacity—there is no relative deflection in the bed and slide. As a result, the formed side rail is perfectly straight.



FORMING SIDE RAILS
. . . 4000 tons press capacity

Cold Stressed Rods—The frame is conventional four-piece construction. But instead of heating and shrinking tie rods in the usual manner, they are cold stressed with hydraulic jacks. This, says the company, insures that stress in the rods is the precise predetermined

men who know cranes know you can depend on BROWNHOIST

Besides being a powerful, efficient unit for regular materials handling work, Brownhoist Cranes are unusually versatile. For example, on the great Mesabi Range where this Brownhoist Crane is loading ore, other Brownhoist Cranes are laying and ballasting track, rerailing cars and doing dozens of other tough production and service jobs. Brownhoist Cranes perform equally well as switch engines because they are built with a specially designed travel generator, motor and axle reduction unit for high tractive power and rapid acceleration. In railroads, steel mills and manufacturing plants, this versatility can save production time and money. So can other specially engineered Brownhoist features like the patented Monitor Type Cab and Clear Vision Boom, the Dynamatic Clutch and the Friction Clutch Boom Hoist. Brownhoist Cranes are strong and rugged for continuous heavy duty operation and long life. They are built in capacities from 25 to 80 tons for virtually every materials handling operation. It will pay you to consult your nearest Brownhoist representative or write today for complete information.

BROWNHOIST BUILDS BETTER CRANES

168

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN

DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago; Canadian Brownhoist, Ltd., Montreal, Quebec • AGENCIES: Detroit, Birmingham, Houston, Los Angeles

Stacking shingles to the rafters at Bird & Son, Inc., Chicago

How to boost your stock ...with the boss

You can cut materials handling time up to 50% and more all along the line—from receiving, clear through to shipping—with TOWMOTOR! Many users have more than doubled storage space. And only TOWMOTOR gives you TowmoTorque, the amazing new drive that eliminates clutching and gear-shifting. Plus effortless TOWMOTOR Power Steering! Plus revolutionary new Diesels with Cushioned Power! Plus time-tested Preventive Maintenance! Send for booklet describing TowmoTorque and Power Steering. TOWMOTOR CORPORATION, Div. 1604, 1226 E. 152nd St., Cleveland, Ohio.

TOWMOTOR
THE ONE-MAN-GANG ®

FORK LIFT TRUCKS AND TRACTORS

Since 1919

TOWMOTOR ENGINEERED FOR QUALITY PERFORMANCE

amount, which is equal to the press' maximum safe working capacity.

The frame is thus virtually a solid unit until work load exceeds stress in the rods. When overloads occur, rods elongate slightly, protecting frame members against critical deflections.

To facilitate manufacture, shipment and erection at Midland, the bed, slide and arch were each made in two pieces. These are held together by heated and shrunk rods. Because of rods' size and amount they are shrunk, each of these members can be considered a solid one-piece unit.

Components, Operation — The bed is equipped with six 42-inch diameter air cushions providing 415 tons pad-pressure with air at 100 pounds. Air cushions were selected because their stripping power is always equal to drawing power. The six cushions are linked together; the six operating valves are controlled by one pilot valve. As a result, the six cushions function as one at all times.

When cushions are close to bottom-stroke, the little air remaining in them is exhausted and they stay down until the slide reaches a predetermined point of the up-stroke. Then the pilot valve closes operating valves, air is bled back into the cushions and pressure pad is returned to its top position.

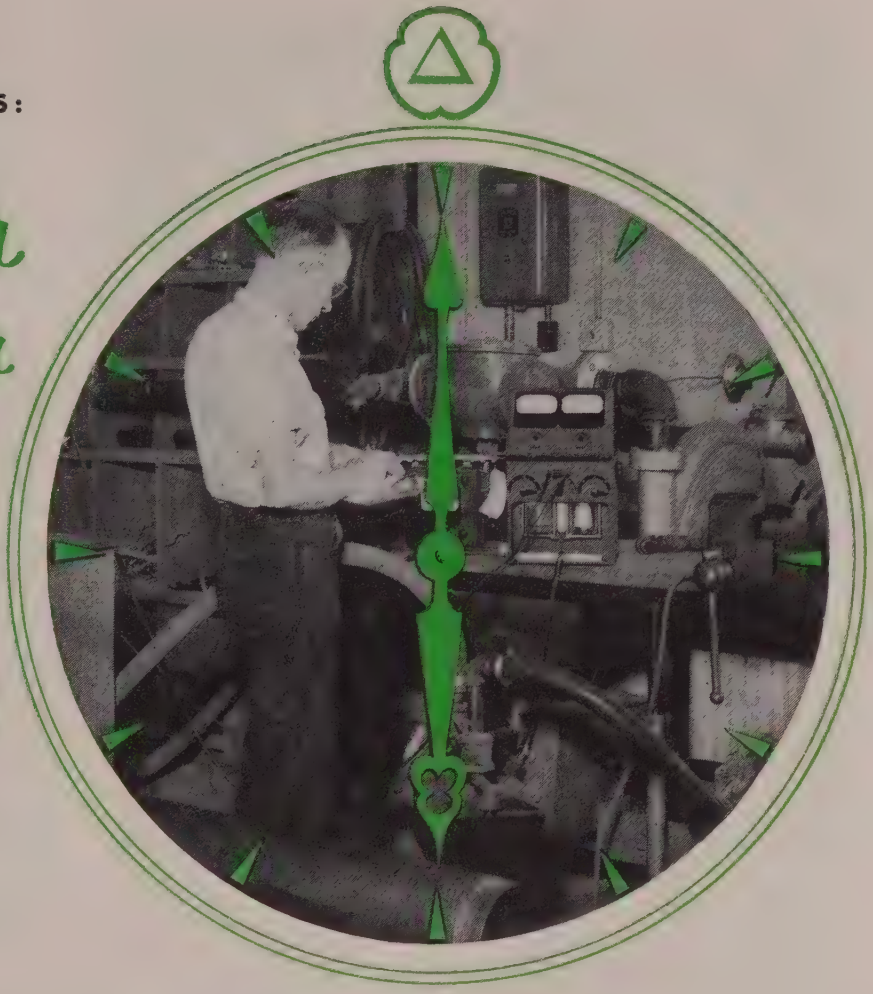
Cushions operating as a unit provide the important feature of this drawing attachment. There can be no upward creep during dwell period on bottom because the air is at atmospheric pressure and cushions are dead. On the return stroke, one cushion cannot lag behind the others. Because each cushion exerts exactly the same force on the pressure pad, the latter cannot tilt during its upward movement. Possibility of distorting the side rail when it is ejected from the die is eliminated. Another advantage: It prevents occasional bent or broken die pins.

Handling Clinic Moves June 10

First in the series of traveling clinics on material handling scheduled for 1953 by Material Handling Institute will assemble June 10 at Hotel Statler, New York. Sessions are scheduled in co-opera

ECLIPSE FUEL ENGINEERING WRITES:

"Heat Prover Completed a 30 Hour Burner Test In Just 6 Hours!"



Amazing Cities Service Heat Prover Works 5 Times As Fast As Old Method... More Accurate, Too!

Robert W. Pixler, Laboratory Supervisor for Eclipse Fuel Engineering Company, Rockford, Illinois writes:

"It did not seem possible that an instrument that is so fast and direct-reading could possibly have the accuracy we demand. But, we found the Heat Prover equally exact, possibly even more exact, than standard commercial testing equipment.

"Our test work with previous instruments was a long, drawn-out affair. But with the Heat Prover, we completed what would normally have been a 30-hour test in just 6 hours!...and we doubt that our old equipment could have maintained the accuracy delivered by Cities Service Heat Prover."

WHEREVER A FURNACE OPERATION IS INVOLVED, the Heat Prover can help increase productivity by providing:

- **Rapid, continuous sampling**
- **Simultaneous reading of oxygen and combustibles**
- **Direct measurement of oxygen and combustibles**
- **Easy portability**
- **No maintenance; no re-calibration**

For details, contact nearest Cities Service office or write Cities Service Oil Company, Dept. D18, Sixty Wall Tower, New York City 5, N. Y.

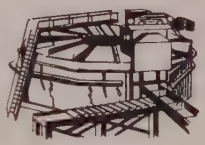
CITIES SERVICE

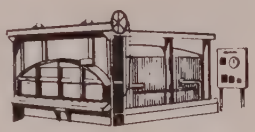
QUALITY PETROLEUM PRODUCTS

GASMACO INDUSTRIAL FURNACES

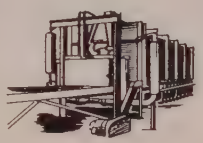
OIL OR GAS FIRED FOR ALL TYPES OF HEAT TREATING

GASMACO furnaces are designed for long, trouble-free service on a wide range of applications. Equipped to handle material of nearly any size or shape, they are ideally suited for forging, heat treating, spheroidizing and annealing.





Exclusive features of GASMACO furnaces are Silicon Carbide Tubes and Rollers which permit operating temperatures up to 2500° F., with fewer replacements. Complete control of the furnace atmosphere is maintained. Annealing is accomplished without decarburization or scale in simple, inexpensive car, pusher, conveyor, chain or roller hearth type furnaces.



All GASMACO furnaces are individually designed to fit your particular furnace requirements and to assure maximum operating economy. It will pay you to investigate these furnaces for your next heat treating job.

SALES REPRESENTATIVES

LEWIS C. BAXTER
2207 Ashland Avenue
Toledo 10, Ohio

McCONNELL SALES & ENGR. CORP.
2809 Central Avenue
Birmingham 9, Alabama

C. E. NOBLE
The Noble Equip. Co.
P.O. Box 39 • LaGrange, Ohio

KLIKA-STRIEBEL CO.
53 West Jackson, Rm. 1040
Chicago 4, Illinois

CHRISTY FIREBRICK CO.
506 Olive Street
St. Louis 1, Missouri

THE GAS MACHINERY COMPANY
16116 WATERLOO ROAD
CLEVELAND 10, OHIO

Designers • Fabricators • Erectors
Gas Plant Equipment and Industrial Furnaces

THE GAS MACHINERY CO. (Canada), Ltd.
HAMILTON, ONTARIO

tion with New York and New Jersey chapters, American Material Handling Society.

The clinic will be divided into several separate panel discussions, meeting concurrently, according to general types of problems presented. One specialist on each panel will be prepared to advise on problems involving industrial gasoline and electric trucks, powered hand trucks, storage batteries and accessories. Other experts will discuss overhead and monorail cranes and hoists; cover conveyors; floor and hand trucks; wheel and caster equipment; and pallets, steel wire and strapping problems.

Plastic Core In Wire Rope

PRODUCTION of a wire rope with plastic instead of a fiber core is the latest thing to come out of Jones & Laughlin Steel Corp.'s wire division in Muncy, Pa. Developed specifically to replace conventional rope in the drilling of oil and gas wells, the new product will also see service in other applications where moisture or other fiber-destroying conditions exist.

Besides giving a wire rope that will stand up under adverse conditions, the plastic core will be produced in this country instead of imported, as the fiber for hemp cores. This would eliminate uncertainty of supply during periods of war or other international stress, says P. D. Somerville, general manager of the J&L wire rope division.

Start of Trend—Neither lack of moisture during storage nor excessive amounts of moisture during use has any effect on the plastic core. But these conditions have an adverse effect on a fiber core, Mr. Somerville points out.

The new plastic core is not expected to entirely replace fiber core in wire rope making for many years. Production of this type of wire is seen as the start of a trend towards the use of more durable material. Since the plastic absorbs no water, the steel of the rope is not subjected to rusting from within. However, fiber must retain some moisture or it will disintegrate and lose its resiliency.

Spectrometer Testing

Instant reading shows percent of each element in metals of five different alloy bases

UNIQUE direct-reading spectrometer is speeding metal quality testing in C-119 Flying Boxcar production at Fairchild Aircraft Division, Hagerstown, Md., cutting time on one operation alone from 4 hours to 5 minutes.

Through a combination of simultaneous electronic, optical and mechanical operations, the spectrometer analyzes metal samples and provides instantaneous dial reading on the percentage of each element in the metal. Exact percentages must be known, since variations affect such properties as hardness, corrosion resistance and tensile strength.

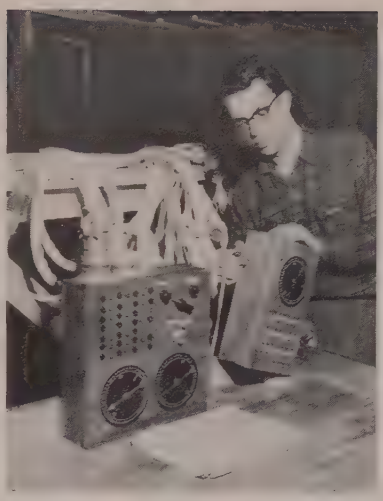
Spots 5 Alloy Bases—While a small number of direct-reading spectrometers are employed by steel mills and foundries, they are limited in the variety of metals and elements they can analyze. The Fairchild equipment can handle metals having five different matrices or alloy bases—aluminum, brass, stainless steel, magnesium and low alloy steels. Metals in the form of rods, plates, billets, sheets, extrusions, tubes, bars and forgings can be tested with equal facility.

Valuable as a stock control device, the Fairchild spectrometer helps verify the chemical analysis affidavits submitted with shipments of raw materials. It has speeded acceptance and stocking of materials by cutting analysis time from a minimum of 4 hours to 5 minutes.

Built to order by Baird Associates after Fairchild Aircraft's quality control department established a set of specifications for metals testing, the spectrometer is so critical that it must be kept in a special room under strict temperature and humidity control to insure maximum accuracy.

Automatic Cycle—Operation is almost completely automatic. The sample is placed in a specimen holder between two electrodes, the door closed and a starter button pushed. The instrument takes over, cycles itself, causes the recorders to stop at correct concentration readings, then shuts itself off.

On low alloy metal samples, percentage of concentration of each element is registered directly on recorders. Each element has its own recorder dial. On high alloy metals, recorder readings are referred to concentration-versus-recorder reading curves to determine true concentrations.



Electronic Wire Tester

Even pinball machine parts are used as components in this wire checking device developed by Georgia Division, Lockheed Aircraft Corp. The tester reduces inspection time on B-27 jet bomber electronic circuits from 16 manhours to one. It checks out a 50-wire cable for shorts in 4 seconds

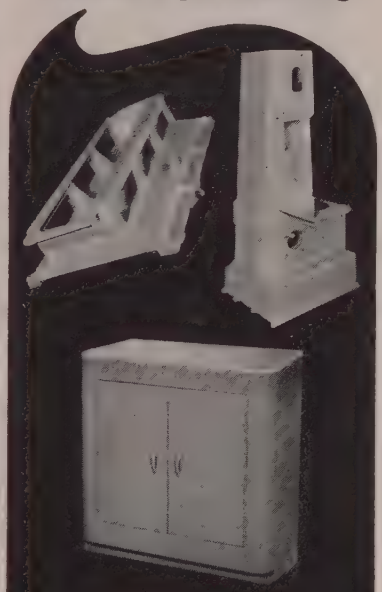
Phenol Waste Manual Published

"Reducing Phenol Wastes from Coke Plants" is the title and subject of another manual in the industrial waste treatment series published by Ohio River Valley Water Sanitation Commission. Compiled by representatives from major steel companies in the area who serve in an advisory capacity to the commission, the manual describes a variety of process changes and treatment methods found to be practical.

The 36-page illustrated report also describes sources, volumes and concentrations of by-product coke wastes and methods for measuring phenols in industrial wastes. The data are based on a survey of 27 coke plants. Copies, priced at $1, are available from the commission at 414 Walnut St., Cincinnati 2.

Consult LITTLEFORD First . . .

FOR WELDMENTS FABRICATED BASES SUB-ASSEMBLIES



You'll find Littleford's experience in precision fabrication of sheet and plate steel makes difficult jobs both easy and economical. Our engineers, skilled craftsmen and complete facilities assure you accuracy, economy and modern design. We know how to provide strength that withstands shock, strain and vibration. Littleford scientific operations also give you greater adaptability with less weight and bulk in steel assemblies, machine bases, machine parts, special parts, frames, guards, mounting structures, etc. And it actually costs you less to get the best, from Littleford's dependable fabrication. Send us your blueprints for estimate.

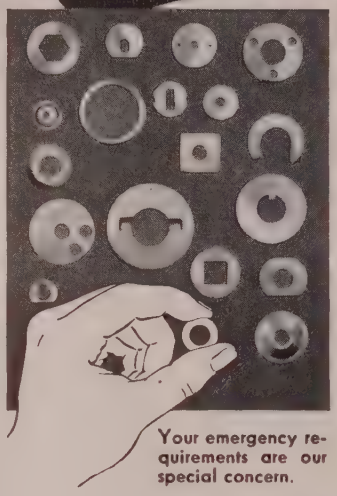
FABRICATORS OF PLATE AND SHEET METAL PRODUCTS FOR INDUSTRY SINCE 1882

LITTLEFORD

LITTLEFORD BROS., INC.
425 E. PEARL STREET
CINCINNATI 2, OHIO

Standard ..Specials

STEEL WASHERS
FOR EVERY NEED



A DEPENDABLE SUPPLIER
FOR 38 YEARS . . .

Your requirements for standard and special steel washers are sure to be satisfied at Joliet. A bank containing thousands of special dies in many shapes and forms, 9/32″ to 8″ O.D., gauges No. 28 to 3/8″, stands ready to answer your needs. A VARIETY OF FINISHES IS AVAILABLE to meet your special needs, including: Electro-plating, Galvanizing, Parkerizing, and Cyanide hardening.

After All!
THERE'S NO SUBSTITUTE
FOR QUALITY AND SERVICE

Your emergency requirements are our special concern.

202 CONNELL AVE.
JOLIET, ILLINOIS

JOLIET WROUGHT WASHER CO.

over 90% OF YOUR MATERIAL HANDLING REQUIREMENTS

can be met with
STANDARD EUCLID CRANES,

whether they are put to Special or General Purpose use. Standard Euclid Cranes are available in capacities of 3, 5, 7-1/2, 10, 15, 20 and 25 tons in various spans.

All detail parts are standardized and jig machined to assure interchangeability.

High grade, wide face, coarse pitch gearing.

Shafts short and heavy to withstand stress.

Anti-friction bearings throughout.

THE EUCLID CRANE & HOIST COMPANY
1365 CHARDON ROAD, EUCLID, OHIO

EUCLID CRANES AND HOISTS
Raise Profits

Blowpipe Slicer

Manganese-bronze castings 13 inches thick are sliced through by powder cutting in less than half the time needed to cold-saw similar pieces 4 inches thick. The Linde Oxweld blowpipe setup is employed to cut up castings for remelting in an experimental program to develop accurate antimagnetic diesel engine flywheels

Broaching Engine Spiders

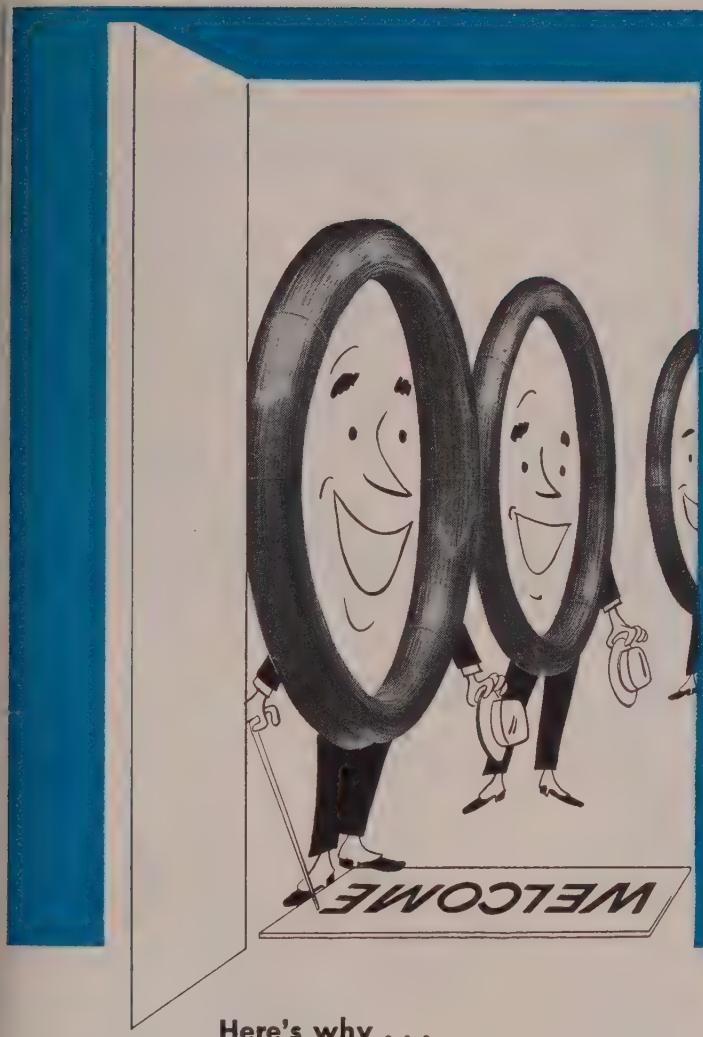
Combination manual and automatic control setup developed by Colonial Broach Co., Detroit, permits broaching of aircraft engine spiders with complete support for the part that is being broached on standard single ram broaching machines.

The machine is a 6-ton, 54 inch stroke single ram, used to broach six identical contours on the six arms of an aircraft spider.

In operation, the spider is placed in the fixture and clamped in place manually, locating from the splined hole.

Each cutting stroke broaches the contours between one set of arms on the spider. When the circuit is actuated to start the cycle, support jacks in the fixture automatically close in and support the two arms of the spider opposite the surfaces being broached.

When the broach has completed the cut, the fixture automatically shuttles clear and the support jacks are released. This allows the operator—while the broach is returning—to unclamp the part and index it manually in the fixture to the next position.



The Welcome Mat's Out for J&L Cold Heading Wire

Here's why . . .

Wire users performing a cold heading operation are constantly looking for increased production, longer die life and better finished products.

It takes cold heading wire that has—

High plastic deformation
High cold malleability
The right finish
The utmost uniformity

and J & L COLD HEADING WIRE MEETS THESE REQUIREMENTS.

Up-to-date cold headers have learned from experience that J&L steel is quality controlled from the mine to the finished product . . . assures them of wire that's chemically and physically *right* . . . that J&L has the modern equipment to produce a really uniform product of high finish. And, finally, that J&L steel-making experience provides a *dependable* source of top-flight product.

Investigate the economies of using J&L Cold Heading Wire. Contact the J & L representative nearest you or write: Wire Products Department, Jones & Laughlin Steel Corporation, 401 Liberty Avenue, Pittsburgh 30, Pa.

BEGINNING A SECOND CENTURY OF PROGRESS · 1853 · 1953 · J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH

J&L STEEL

Announcing.. a NEW and unique service...

Combining creative engineering... experienced consultants... efficient production is offered to
Every User of Metal Products

★

THE LEAKE *Engineering* COMPANY

(A MICHIGAN CORPORATION)

P. O. BOX 715 MONROE, MICHIGAN

James M. Leake, President & General Manager

COMPLETE OR PARTIAL SERVICES:

Imagination	Developments	Production
Practical Ideas	Die Designs	Machining
Product Designs	Die Making	Finishing
Cost Estimates	Tryout Samples	Packaging

FOR:

- End Product Manufacturers
- Aluminum & Brass Fabricators
- Steel Fabricators
- Contract Stampers
- Steel Mills
- Die Shops
- Associated Facilities

USING METAL STAMPINGS: ANY SIZE, SHAPE, THICKNESS OR ANALYSIS,
Either Ferrous or Non-Ferrous Metals.

THIS SERVICE CAN BE OF REAL VALUE TO YOU!

Address your Inquiries to
LEAKE ENGINEERING COMPANY
P. O. Box 715
Monroe, Michigan

★

Literature Available
—Write—

A portion of the Leake library of metal stamping progress showing many parts designed, engineered, and produced by Leake methods.

Note: This organization will operate as an entirely separate unit from The Leake Stamping Company which will continue as in the past years serving to extent of plant capacity.

MEN OF INDUSTRY

(*Continued from Page 80*)

PAUL R. LOUGHIN
. . . transfers to B&W boiler div.

Mfg. Co., Waterbury, Conn. He is succeeded by **Robert Weber** as maintenance engineer, manufacturing departments.

Paul R. Loughin was named an executive assistant of **Babcock & Wilcox Co.,** New York, and transferred to the staff of the boiler division. He has been chief of staff engineering since 1947.

General Controls Co., Glendale, Calif., appointed **H. A. McIntosh** to head its new department for study and analysis of customer requirements in the design and development of new products.

John A. Mason was appointed plant superintendent of **Nash Motors of Canada Ltd.,** Toronto. He joined the company in 1949 as superintendent of planning.

Robert T. Pratt, assistant sales manager, was named eastern regional sales manager for **Clary Multiplier Corp.** succeeding **Frank L. Randall.** Mr. Platt will have headquarters at Linden, N. J.

George C. Somes Jr., manager since 1944 of the New York City sales territory for **Standard Pressed Steel Co.,** Jenkintown, Pa., has been named to the newly created position of manager of sales promotion and merchandising.

H. H. Buggie & Co., Toledo, O., appointed **Ray P. McAlister** assist-

"Automatic" SPRAY Sprinklers

TERRIFIC . . . That's the word that insurance underwriters use in describing the new "Automatic" SPRAY Sprinkler.

It's a "Sure Fire Killer", designed for quick action and maximum effective distribution of water.

Property owners get protection-PLUS in all types of buildings with this vastly improved fire fighter that can be installed on both exposed and concealed piping systems. And . . . "Automatic" SPRAY Sprinklers are easily interchangeable with obsolete devices . . . cost no more than old style sprinklers.

This important advancement in the science of fire safety is further reason why "Automatic" Sprinkler is universally recognized as FIRST IN FIRE PROTECTION!

New literature available on request

"Automatic" Sprinkler

CORPORATION OF AMERICA · YOUNGSTOWN, OHIO

OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

NEW WILLSON Kover-Mor Goggles

with strong, lightweight nylon eye cups

Fit easily over modern prescription glasses— use standard 50 mm. round lenses

They offer many benefits to workers in hazardous occupations—

improved design . . . provides snug, comfortable fit—ample room over modern, large-frame prescription glasses.

nylon eye cups . . . molded of tough lightweight nylon—strongest plastic used in goggle cups; non-flammable—and won't conduct heat.

standard lenses . . . 50 mm. round flat Super-Tough® lenses used eliminate need to stock odd size replacement lenses—external lens retaining ring makes lens replacement quick and easy.

extra ventilation . . . two-way ventilation is provided by slots in retaining ring and screens in eye cups.

new lightweight comfort . . . total weight of these new goggles is practically the same as smaller "cover all" styles.

NOTICE THE RIGID METAL TOP BAR

—standard on Willson Kover-Mor Goggles. Makes them easier to handle—holds them firmly in place.

Ask your Willson distributor for new Kover-Mor* Cup Goggles

*Trademark

More Than 300 Safety Products Carry This Famous Trademark

WILLSON®

Established 1870

WILLSON PRODUCTS, INC. • 233 Washington St. • Reading, Penna.

H. LeROY STOUT
. . . Engineering & Research factory mgr.

ant to the general manager. In the last ten years he has served as sales engineer and assistant sales manager for Cannon Electric Co.

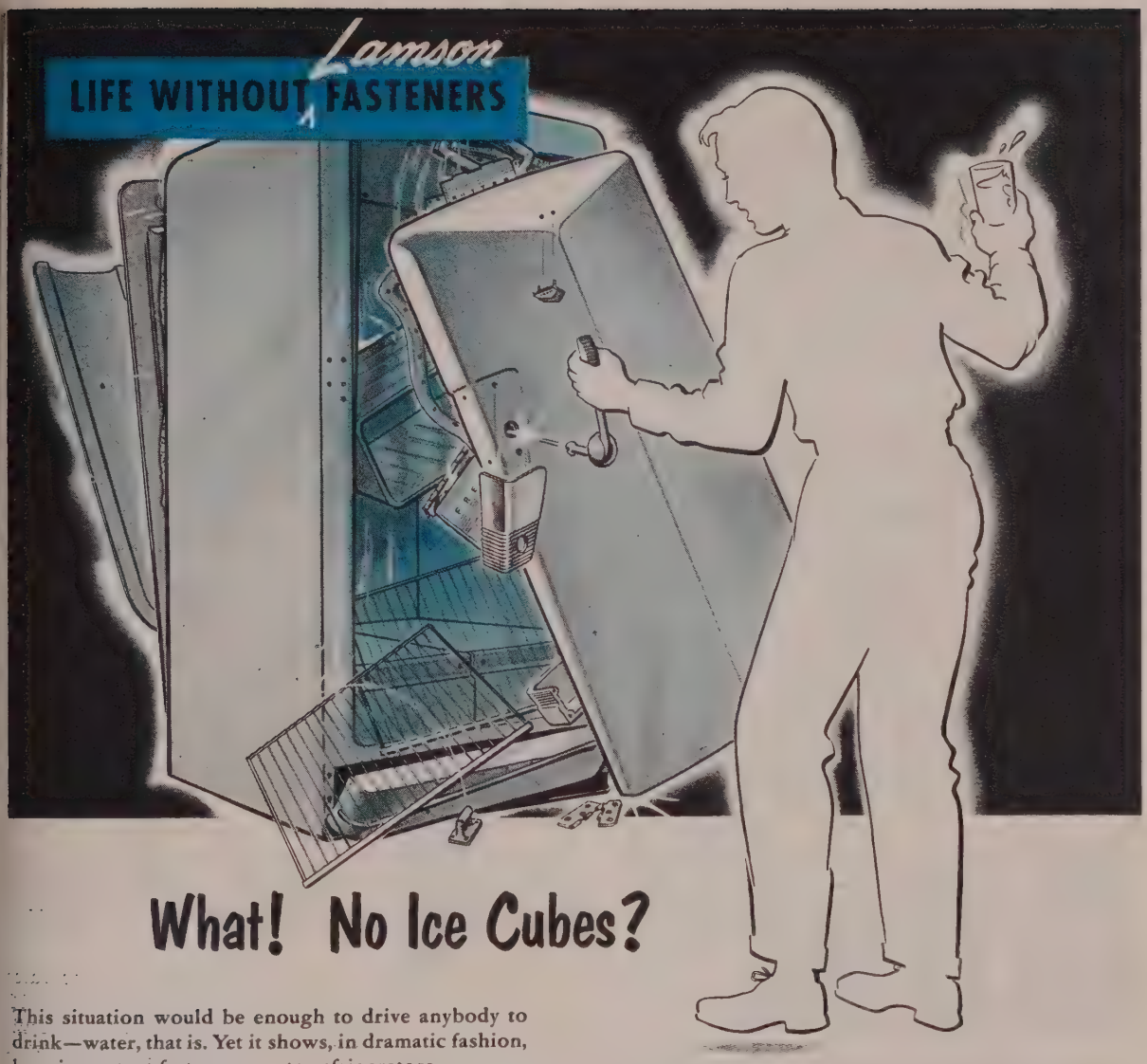
Engineering & Research Corp., Riverdale, Md., appointed **H. LeRoy Stout** manager of the factory department and **Robert F. Richards** director of material and manufacturing control. Mr. Stout has been with Erco since its founding in 1931.

Earl M. Muhleck was made chassis engineer at **Willys-Overland Motors Inc.**, Toledo, O. He joined Willys' engineering division in 1950 as assistant chassis engineer.

Paul Feeger was assigned to the Albuquerque, N. Mex., industrial sales engineering staff of **Minneapolis-Honeywell Regulator Co.** He transfers from the Denver office and now specializes in sales and service of products of the industrial and valve divisions.

F. Alan Tiarks was named Dallas, Tex., district sales engineer for **Granco Steel Products Co.**, subsidiary of Granite City Steel Co.

Joseph K. Strickland and **Joseph P. Foley** were added to the Baldwin testing equipment sales staff in the New York City and Cleveland areas, respectively, for **Baldwin-Lima-Hamilton Corp.** Mr. Strickland formerly was sales engineer, Industrial Products Division, Johns-Manville Co. and Mr. Foley


LIFE WITHOUT Lamson FASTENERS

What! No Ice Cubes?

This situation would be enough to drive anybody to drink—water, that is. Yet it shows, in dramatic fashion, how important fasteners are to refrigerators.

Of course, this will never really happen to any modern refrigerator, thanks to the constant fastener research carried on by Lamson & Sessions in cooperation with leading appliance manufacturers.

But there *is* a moral to this story: When you select fasteners for any product, it will pay you to consult Lamson *first.* If the answer isn't already in our files, our years of experience in helping manufacturers select the "just right" fastener for their products, can be of immeasurable value to you.

Lamson + Sessions

The LAMSON & SESSIONS Co.
1971 West 85th St. • Cleveland 2, Ohio
Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

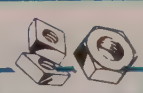
FOR PROMPT DELIVERY AND HELPFUL SERVICE, ORDER FROM YOUR LAMSON DISTRIBUTOR

MACHINE SCREWS
Precision made for fast, economical assembly.

PLUG NUTS
Ideal for blind or hard-to-reach places.

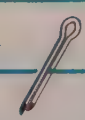
TAPPING SCREWS
Choice of round, pan, truss, flat oval hexagon and Phillips heads.

CAP SCREWS
"1035" Hi-Tensile Heat-treated steel.



SQUARE AND HEX MACHINE SCREW NUTS
Semi-finished, hot pressed, cold punched.

LOCK NUTS
Economical, vibration proof. Can be used repeatedly.



COTTER PINS
Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS
Cup point type, hardened and heat-treated.

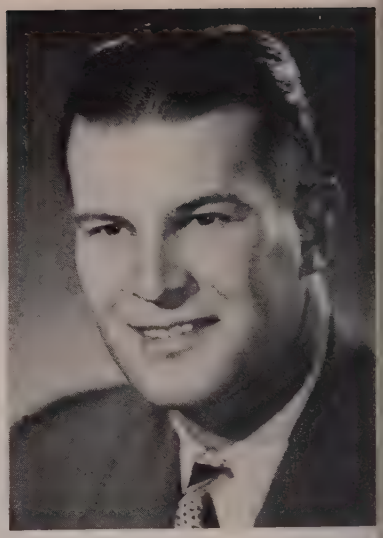
was applications engineer for electric industrial equipment handled by Sterling Electrical Motors Inc.

Bethlehem Pacific Coast Steel Corp. appointed **C. Travers Foxworth** resident sales representative in Spokane, Wash., to cover eastern Washington, northern Idaho and western Montana.

A. J. Bopp, who started in the steel business in 1904 with West Leechburg Steel Co., and for the last seven years with Detroit Tube & Steel Co., formerly Bopp Steel Corp., which he founded, will retire May 1.

Samuel P. Felix was appointed general manager, **De Laval Turbine Pacific Co.,** San Francisco. He assumes his new position May 1. Since 1949 he has been superintendent of the De Laval North plant.

A. J. Lehmkuhl, vice president, secretary-treasurer of **Geuder, Paeschke & Frey Co.,** Milwaukee, was elected to the board of directors.



GEORGE M. BRYSON
. . . Bethlehem Pacific chief industrial eng.

George M. Bryson, supervisor of piecework rating for **Bethlehem Pacific Coast Steel Corp.** since 1948, was appointed chief industrial engineer for plants in Seattle, South San Francisco and Los Angeles, and for its fabricating works in those cities and in Alameda, Calif.

A. G. Crothers was named Little Rock, Ark., representative of **J. J. Finnigan Co.** He previously was with Crane Co. for 25 years as a sales engineer.

David W. Towler joined the sales staff, **Chemical Mfg. Division,** M. W. Kellogg Co., subsidiary of Pullman Inc., New York. **Leo J. Fitzgerald** was assigned to the division's Ohio sales staff.

Robert G. Hess is now general manager, Watertown, N. Y., division, **New York Air Brake Co.**

Payne C. Barzler Jr. was made Houston district manager, **Chase Brass & Copper Co. Inc.**

Robert A. Ohman of Republic Supply Co. of California, was made sales manager of the firm's northern division. He is located at the northern headquarters at San Leandro, Calif.

Frank D. Wallace was named chief engineer, **Magna Mill Products,** South Gate, Calif.

John T. Mains was made sales representative for **Heil Co.** with offices in Denver.

GLOBE

SUPERIOR LADLE BRICK

RESIST HEAT LONGER . . . . .

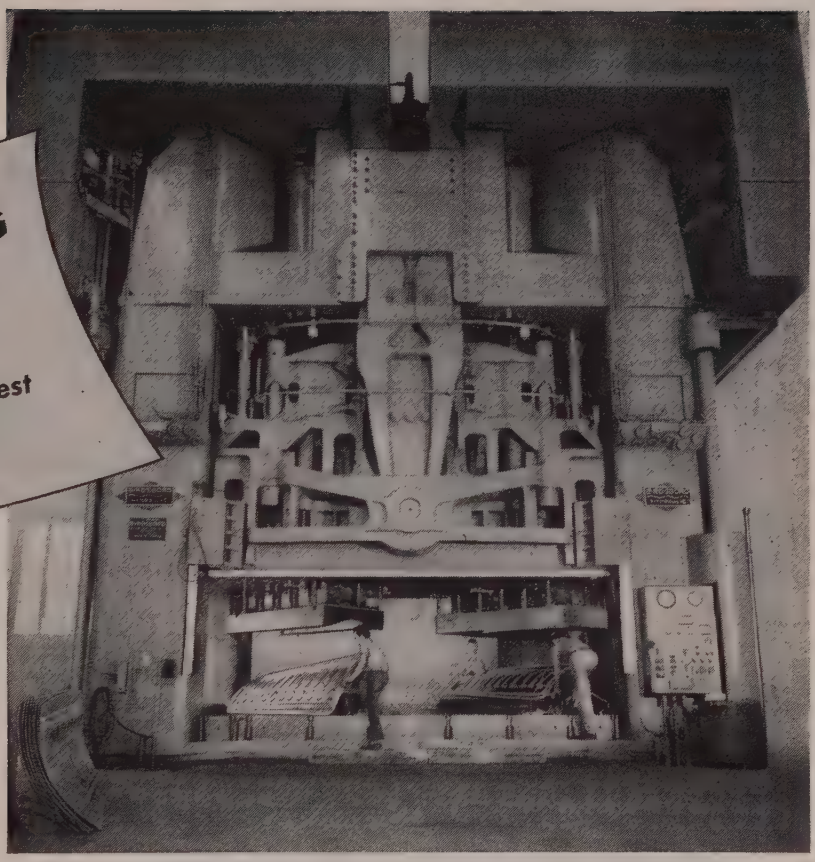
Wire cut or dry pressed, this excellent quality brick has been a standard name among steel men since shortly after the close of the Civil War. These bricks stand up better under terrific heat; this salvages much of the time lost in refractory replacement, and increases melting capacity. Our refractory experience is at your disposal; please feel free to consult with us at any time.

SERVING THE STEEL INDUSTRY SINCE 1873

The GLOBE BRICK Co.
EAST LIVERPOOL, OHIO

IT'S HAPPENING TODAY AT LOCKHEED

with the world's largest press of its kind!

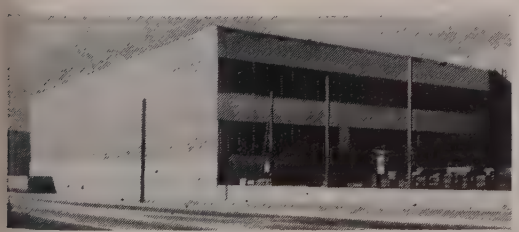


Exerting 16,000,000 lbs. pressure, this 8,000 ton press is forming plane sections up to 10 x 30 ft. in 1/2 in. aluminum.

BIRDSBORO

hydraulic press

Lockheed Aircraft Corporation is now able to produce larger individual parts with heavier sections of new, tougher metals demanded by tomorrow's high speed aircraft. And Lockheed is doing it with this new 8,000-ton hydraulic press designed and built by BIRDSBORO. Largest of its kind in the world, this huge machine has a total height of 48 feet of which 12 feet is foundation embedded in the floor. The operator of this giant press controls a force equivalent to the weight of a battle cruiser as he forms components of tough aluminum alloy a half-inch thick and up to ten by 30 feet in size.



The new Birdsboro Hydraulic Press takes its place in Lockheed's "Hall of Giants", housing a multimillion dollars worth of heavy-duty production machinery.

Agents In:
Boston, Massachusetts—Cincinnati, Ohio—Dayton, Ohio—Kansas City, Missouri—Los Angeles, California—Oklahoma City, Oklahoma—Pittsburgh, Pennsylvania—St. Louis, Missouri—Tulsa, Oklahoma

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA.

HYDRAULIC PRESSES

HPL 2-53
Offices in Birdsboro, Pa. and Pittsburgh, Pa.

•designers and builders of: Hydraulic Presses • Steel Mill Machinery • Crushing Machinery • Rolls • Special Machinery • Steel Castings

Corrosion-resistance and strength

PLUS

MACHINABILITY

Superheated steam scorches across them . . . centifugal force tries to tear them apart . . . and an out-of-balance turbine would be disastrous. That's the punishment these steam turbine blades have to take. And, that's the reason why they're forged and machined from Republic ENDURO Stainless Steel Bars.

ENDURO stubbornly resists corrosion . . . and rust. It maintains its great strength at high temperatures. It can be accurately and economically forged and machined.

Three different forms of ENDURO bars are used in turbine blade manufacture: hot rolled bars for forging larger blade sizes; cold finished bars for machining smaller sizes; and a cold finished special section, one of many such sections produced by Republic's Union Drawn Steel Division.

Have you an application in which you need increased strength? . . . increased resistance to corrosion? . . . plus economical machining? Then, investigate Republic ENDURO Stainless Steel . . . in hot rolled or cold finished bars, and in wire. Ask Republic for metallurgical assistance in applying them, too. Just write:

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, N. Y.

Republic

REPUBLIC STEEL

ENDURO® STAINLESS STEEL

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

The Market Outlook

WATCH steel demand for a clue as to how much steel prices will be raised. Demand will be an important factor in determining what happens.

Spokesmen for a number of the steel companies have, in the last few weeks, been building up a case for a general increase in steel prices. Thus far since end of government price control, any price increases on steel have been merely adjustments on a few products. Republic Steel Corp. last week made adjustments, most of them upward, in extras on hot-rolled and cold-finished carbon steel bars. Extras are charges, in addition to base prices, for such things as specific qualities and sizes and special handling. Base prices were not altered.

TAKEN IN STRIDE—Republic's move on bar extras did not unduly disturb consumers. Price adjustments to erase inequities that accumulated during government price control have been expected, and particularly on bars, historically a low-profit item for the steel companies.

Although the steel industry's low and declining rate of earnings gives it good grounds for thinking about a general price increase, such as would affect all products and their base prices, it has been reluctant to make such a boost. The immediate deterrents are the public and government reaction to a general increase so soon after restoration of price freedom and the inflationary effect it would have on the approaching wage negotiations with the steelworkers.

DEMAND WILL COUNT—Despite the outcome of wage talks, the industry will be influenced to a considerable degree by the then current and prospective demand for steel. A trend toward a buyers' market would inject conservatism in any deliberations on price hikes. An apparently insatiable demand of today can be sluggish less than a year hence.

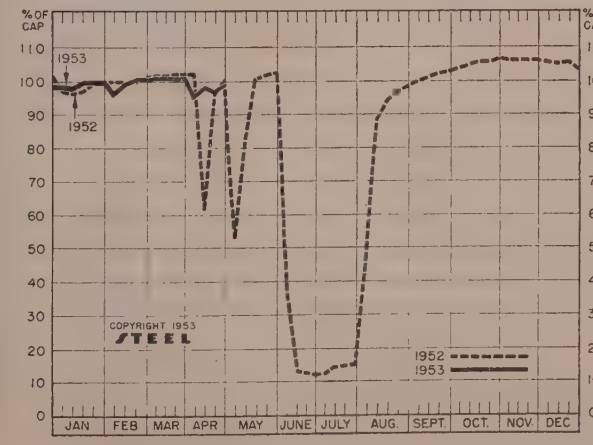
HOW TIMES CHANGE—Look at the situation in the nonferrous metals market. A year ago you could easily wonder whether the demand for the major nonferrous metals ever would be satisfied. Since then, demand has eased off in varying degrees for lead, zinc, tin and copper to name a few, and their prices reflect it. The April, 1952, average price per pound was 18.72 cents for lead, 19.5 cents for zinc, 121.5 cents for tin and 24.5 cents for copper. After another decline last week, lead was 11.8. Zinc was 11 cents. Tin was 93.5 cents on the open market. Although copper was 30 cents, it had been higher this year.

Two of the major nonferrous metals higher in price now than they were a year ago are those still in strong demand—aluminum and nickel. The April, 1952, price average for aluminum was 19 cents. Today it is 20.5 cents. The April, 1952, price average for nickel was 56.5 cents. Today it is 60 cents.

ANOTHER REMINDER—Steelmaking scrap is another reminder that supply and demand influence prices in a free market. Only a little more than a year ago, a scrap collection drive was being waged. Today, steelmakers have comfortable inventories of scrap, and are buying lightly. A year ago, STEEL's price composite on steelmaking scrap was $43. Later it rose, followed by a decline. A further weakening last week let the composite sag to $42.67.

SPEED-UP— Reflecting the strong demand for steel, the production of steel for ingots and castings in the week ended Apr. 25 was at 99.5 per cent of capacity. This was a rise of 2.5 points over the preceding week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Apr. 25	Change	Same Week 1952	Same Week 1951
Pittsburgh	98	— 0.5*	102.5	102.5
Chicago	105	0	101.5	108
Mid-Atlantic	97.5	+ 1	98	101
Youngstown	106	+11	105	104
Wheeling	99.5	— 1	101.5	97.5
Cleveland	104	— 1.5*	99	100
Buffalo	106.5	0	104	104
Birmingham	101	0	102	106
New England	85	— 2	85	90
Cincinnati	96	+ 2	96	105
St. Louis	86.5	+11	92	97
Detroit	107	+ 1	112	109
Western	106	— 4.5	103	107
Estimated National Rate	99.5	+ 2.5	100.5	103.5

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 39 Production-Engineering News—p. 99

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	Apr. 21 1953	Apr. 14 1953	Month Ago	March Average
(1947-1949=100)	130.7	130.7	130.7	130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Apr. 21, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv.	6.765
Track bolts	9.953	Strip, C.R., carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.333
Joint bars	4.925	Pipe, black, buttweld (100 ft).	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft).	8.778
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.685	Terne plate (100 lb base box).	7.750
Bars, stainless (lb)	0.153	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	6.008	Wire, barbed (80 rod spool).	5.880
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted: Calculated by STEEL*	Apr. 23 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	181.31	181.31	181.31	171.92	135.91
Index in cents per lb.	4.912	4.912	4.912	4.657	3.682

ARITHMETICAL PRICE COMPOSITES: Calculated by STEEL*					
Finished Steel NT	$110.98	$110.98	$110.98	$106.32	$81.14
No. 2 Fdry, Pig Iron, GT	55.04	55.04	55.04	52.54	39.65
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.18
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	40.26
Steelmaking Scrap, GT	42.67	43.42	44.17	43.00	40.42

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Apr. 23 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del Philadelphia	4.502	4.502	4.502	4.223	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.85	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del., Philadelphia	4.13	4.13	4.13	3.915	2.968
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60–75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.71
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.95
Strip, H.R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	3.05
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.85-5.35	3.80
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.775
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.30
Tin plate, box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70
SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$54.00
Wire rods, 7/32-9/64", Pitts.	4.425	4.425	4.425	4.10-30	3.175
PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.00
Basic, Valley	54.50	54.50	54.50	52.00	39.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	42.004
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	57.11	42.504
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.49	42.23
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$44.00	$44.00	$44.00	$44.00	$40.25
No. 1 Heavy Melt, E. Pa.	43.50	43.50	46.00	42.50	42.00
No. 1 Heavy Melt, Chicago	40.50	42.75	52.50	42.50	39.00
No. 1 Heavy Melt, Valley	42.00	42.00	44.25	44.00	40.25
No. 1 Heavy Melt, Cleve.	42.00	42.00	44.25	43.00	39.75
No. 1 Heavy Melt, Buffalo	45.50	45.50	47.00	43.00	43.00
Rails, Rerolling, Chicago	51.50	52.00	56.00	52.50	49.50
No. 1 Cast, Chicago	42.50	42.50	44.00	49.00†	69.00

† F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$12.50
Beehive, Fdry, Connlsvl.	17.00	17.00	17.00	17.50	14.875
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	18.00

PIG IRON

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies on pages 184-185.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity,Ala. R2	50.88	51.38	....	....
Birmingham R2	50.88	51.38	....	....
Birmingham S9	....	51.38	....	....
Woodward,Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo R2	54.50	55.00	55.50	....
Buffalo H1	54.50	55.00	55.50	....
Tonawanda,N.Y. W12	54.50	55.00	55.50	....
No.Tonawanda,N.Y. T9	....	55.00	55.50	....
Boston, del.	65.15	65.65	66.15	....
Rochester,N.Y., del.	57.52	58.02	58.52	....
Syracuse,N.Y., del.	58.62	59.12	59.62	....
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50	....	55.00	....
IndianaHarbor,Ind. I-2	54.50	....	55.00	....
So.Chicago,Ill. W14	54.50	55.00	55.00	....
So.Chicago,Ill. Y1	54.50	55.00	55.00	....
So.Chicago,Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich., del.	....	61.30	61.30	....
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	....
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N3	54.50	....	....	55.50
Duluth I-3	....	....	55.00	....
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett,Mass. E1	....	59.50	60.00	....
Fontana,Calif. K1	60.50	61.00	....	....
GraniteCity,Ill. G4	56.40	56.90	57.40	....
St. Louis, del. (inc. tax)	57.15	57.65	58.15	....
Ironton,Utah C11	54.50	55.00	....	....
Geneva,Utah C11	54.50	55.00	....	....
LoneStar, Tex. L6	50.50	*51.00	51.00	....
Minnequa,Colo. C10	56.50	57.50	57.50	....
Rockwood,Tenn. T3	....	....	58.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	55.00	55.00	55.50
Pitts.,N.&S. sides, Ambridge				
Aliquippa, del.	....	56.37	56.37	56.87
McKeesRocks, del.	....	56.04	56.04	56.54
Lawrenceville, Homestead, Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge, del.	....	57.45	57.45	57.95
Bessemer,Pa. U5	54.50	....	55.00	55.50
Clairton,Rankin,So.Duquesne,Pa. U5	54.50	....	....	....
McKeesport,Pa. N3	54.50	....	....	55.50
Monessen,Pa. P7	56.50	....	....	....
Sharpsville,Pa. S6	....	....	55.00	55.50
Steelton,Pa. B2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	....
Youngstown Y1	54.50	55.00	55.00	....
Youngstown U5	54.50	....	....	55.50
Mansfield,O., del.	59.15	59.65	59.65	60.15

*Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Los phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton,Pa. B2	62.50
Philadelphia, delivered	66.05
Troy,N.Y. R2	62.50

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 30.00c, Conn. Valley; Lake nom.; foreign electrolytic, del. 30.00c-36.50c.

Brass Ingots: 85-5-5-5 (No. 115) 27.50c; 88-10-2 (No. 215) 37.75c; 80-10-10 (No. 305) 32.00c; No. 1 yellow (No. 405) 22.75c.

Zinc: Prime western 11.00c; brass special 11.25c, intermediate 11.50c; East St. Louis; high grade 12.35c, and special high grade 12.50c delivered.

Lead: Common 11.80c; chemical 11.90c; corroding, 11.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 20.50c, pigs 19.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 22.75-24.00; No. 12 foundry alloy (No. 2 grade) 22.00-22.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.00-24.00; grade 2, 22.50-23.50; grade 3, 21.50-22.50; grade 4, 20.50-21.50.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 27.00c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt RFC, 121.50c; outside market 93.50c, nom.

Antimony: American 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs, 62.65c; "XX" nickel shot, 63.65c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $195-$197, per 76-lb flask.

Cadmium: "Regular" straight or flat forms, $2 del; special or patented shapes $2.15.

Beryllium-Copper: 3.75-4.25% Be, $40.00 per lb of contained beryllium, with balance as copper at market price on date of shipment, f.o.b. Reading, Pa.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 85.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-$185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Cents per pound, f.o.b. mill, effective Apr. 1, 1953. Listings are lowest quotations.)

Sheet: Copper 50.48; yellow brass 42.87; commercial bronze, 95% 49.89; 90% 48.76; red brass, 85% 47.11; 80% 45.99; best quality, 44.43; nickel silver, 18%, 59.84; phosphor-bronze grade A, 5%, 70.50.

Rod: Copper, hot-rolled 46.83; cold-drawn 48.08; yellow brass free cutting, 36.68; commercial bronze 95% 49.58; 90% 48.45; red brass 85%, 46.80; 80%, 45.68.

Seamless Tubing: Copper 50.42; yellow brass 45.78; commercial bronze, 90%, 51.32; red brass, 85%, 49.92.

Wire: Yellow brass 43.16; commercial bronze, 95%, 50.18; 90%, 49.05; red brass, 85%, 47.40; 80%, 46.28; best quality brass, 44.72.

(Base prices, effective Apr. 1, 1953)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 37.46; 30,000 lb lots, 37.58; l.c.l. 38.08. Weatherproof, 100,000 lb, 37.85; 30,000 lb, 38.10; l.c.l., 38.60. Magnet wire del., 15,000 lb or more 43.93; l.c.l., 44.68.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders, Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.8
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— 17S-T4	Hexagonal 17S-T4
0.125	56.8	...
0.156-0.188	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $17.00 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $17.00 per cwt. Traps and bends: List prices plus 30%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Mar. 9, 1953) Sheets, cold-rolled 86.50c. Strip, cold-rolled 92.50c. Rods and shapes, 82.50c. Plates, 84.50c. Seamless tubes 115.50c.

MONEL

(Base prices f.o.b. mill, efective Mar. 9, 1953) Sheets, cold-rolled 67.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 57.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb 58.00c-65.00c; 25 to 99 lb, 48.00c-55.00c; 100 lb to 5000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Apr. 22-23	30.00	11.80	11.00	93.50-121.50	20.50	34.50	60.00	85.25
Apr. 20-21	30.00-30.50	11.80	11.00	95.00-121.50	20.50	34.50	60.00	85.25
Apr. 17-18	30.00-30.50	12.30	11.00	97.50-121.50	20.50	34.50	60.00	85.25
Apr. 16	30.00-30.50	12.30	11.00	98.00-121.50	20.50	34.50	60.00	85.25
Apr. 15	30.00-32.00	12.30	11.00	95.00-121.50	20.50	34.50	60.00	85.25
Apr. 14	30.00-32.00	12.80	11.00	98.50-121.50	20.50	34.50	60.00	85.25
Apr. 13	30.00-32.00	12.80	11.00	99.50-121.50	20.50	34.50	60.00	85.25
Apr. 10-11	30.00-32.00	12.80	11.00	105.00-121.50	20.50	34.50	60.00	85.25
Apr. 9	30.00-33.00	12.80	11.00	110.50-121.50	20.50	34.50	60.00	85.25
Apr. 7-8	30.00-33.00	12.80	11.00	116.25-121.50	20.50	34.50	60.00	85.25
Apr. 6	30.00-33.00	13.30	11.00	116.25-121.50	20.50	34.50	60.00	85.25
Apr. 2-4	30.00-34.50	13.30	11.00	116.50-121.50	20.50	34.50	60.00	85.25
Apr. 1	30.00-34.50	13.30	11.00	118.50-121.50	20.50	34.50	60.00	85.25
Apr. 1952 Avg.	24.50	18.723	19.50	121.50	19.00	49.077	56.50	88.00
Mar. 1953 Avg.	30.51	13.30	11.00	121.50	20.50	34.50	60.00	85.25
Feb. 1953 Avg.	25.136	13.30	11.431	121.50	20.50	34.50	60.00	85.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 42.18c; oval 41.68c.

Nickel Anodes: Rolled, oval, carbonized, carloads 81.00c; 5000 to 29,999 lb, 83.00c; 500 to 4999 lb, 85.00c; 1 to 499 lb, 89.00c, f.o.b. Cleveland.

Nickel Chloride: In 100 lb bags; 10,000 lb and over, 37.00c; 5000 to 9900 lb, 38.00c; 400 to 4900 lb, 40.00c; 300 lb, 42.00c; 200 lb, 43.00c; 100 lb, 45.00c, f.o.b. Cleveland.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers $1.10 per lb; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on $1.215 tin.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac. Based on $1.215 tin.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on $1.215 tin.

Stannous Chloride (Anhydrous): In 400 lb bbl, $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J., freight allowed on 100 lb or more. Based on $1.215 tin.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 20,000 pounds, f.o.b. shipping point; on lots over 20,000 pounds at one time, of any or all kinds of scrap, add 1 cent per pound.)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	28.625	28.625	27.875
Yellow Brass	21.375	21.125	19.625
Commercial Bronze			
95%	27.250	27.000	26.500
90%	26.125	25.875	25.375
Red Brass			
85%	25.125	24.875	24.375
80%	24.125	23.875	23.375
Best Quality(71-80%)	22.500	22.250	21.750
Muntz metal	20.000	19.750	19.250
Nickel silver, 10%	25.250	25.000	12.625
Phos. Bronze, A	30.625	30.375	29.375
Naval Brass	20.000	19.750	19.250
Manganese Bronze	20.000	19.750	19.250

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 22.50c, nom.; No. 2 copper 21.00c, nom.; light copper 19.50c, nom.; refinery brass (60% copper) per dry copper content 20.00c, nom.

INGOT MAKERS' COPPER AND BRASS SCRAP BUYING PRICES

(Carlots, delivered)

No. 1 copper, nominal; No. 2 copper, nominal; light copper, nominal; No. 1 composition borings nominal; No. 1 composition solids, nominal; radiators, nominal; heavy yellow brass solids, nominal; yellow brass turnings, nominal.

SMELTERS' BUYING PRICES FOR SCRAP ALUMINUM

(Carlots, delivered)

2S aluminum clippings, 15.50-16.50c; mixed clippings, 13.00-15.00c; old aluminum sheet, 13.00-15.00c; old aluminum cast, 13.00-13.50c; borings and turnings, 12.50-14.00c.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 23.00; No. 2 19.50-20.00; light copper 17.50-18.50; No. 1 composition red brass 17.00; No. 1 composition turnings 17.00-17.50; mixed brass turnings 11.50; new brass clippings 17.50-18.00; No. 1 brass rod turnings 16.00-17.00; light brass 10.00-11.00; heavy yellow brass 12.50-13.00; new brass rod ends 16.50-17.50; auto radiators, unsweated 13.00-14.00; cocks and faucets 15.00-16.00; brass pipe 16.00-17.00.

Aluminum: Clippings 2S 11.50; old sheets 8.00; crankcase 8.00; borings and turnings 5.50; pistons and struts 5.00.

Tin: No. 1 pewter 55.00; block tin pipe 80.00; No. 1 babbitt 45.00.

Lead: Heavy 8.75-9.25; battery plates 4.50-4.75; linotype and stereotype 10.50-11.00; electrotype 8.75-9.00; mixed babbitt 11.50-13.00.

Zinc: Old zinc, 4.50; new die cast scrap, 4.50; old die cast scrap, 3.50.

Nickel: Sheets and clips 58.00-60.00; rolled anodes 58.00-60.00; turnings 58.00-60.00; rod ends 58.00-60.00.

Monel: Clippings 33.00; old sheet 30.00; turnings 25.00; rods 33.00.

The Metal Market

Metalworking plant purchasers are becoming increasingly price conscious as they no longer have to worry about nonferrous metals supply. Price declines continue

BARGAINS for buyers is still the strongest trend in nonferrous metals as metal merchants trim the fat off selling prices to keep up with the competition.

Harder selling days are ahead for metalworking, and industrial buyers are getting more price conscious. Now that they no longer have to worry about getting materials at any price, they can concentrate on getting them at a good price.

Preparation—Consumption of nonferrous metals so far this year is well ahead of 1952, but bookings, while good, aren't coming in at a pace that offsets output. As a result, backlogs of new business are shrinking. Brass and wire mills, for example suffered an 18 per cent drop in new orders in March. It's no cause to head for storm cellars, but consensus is that more normal times are approaching.

One reason industry is paring raw materials stocks lies in wavering prices. Buyers have an understandable reluctance to make moves that are good one day and foolish the next. While many people get a kick out of trying to outguess the market, some vent their spleen on producers for what they believe to be unnecessary price changes.

Mercurial—A strange situation existing today is what one market observer calls a case of "the tail wagging the dog." It's the market price to a great extent that's determining buying demand rather than vice versa. Those who want stable prices blame commodity trading for the abrupt moves, particularly the mercurial London metal exchange.

For the most part, price changes have been downward lately. Last week saw copper strike a one-price level at 30 cents for domestic primary and custom smelters' metal. Imported copper, with the exception of Chilean, was near that figure and in some cases shading it. From now on, the pressure will be to get the best deal below 30 cents, though no runaway declines are in the making. Chilean copper holds at 36.50 cents. Loss of about 10,000 tons of Anaconda's Chuquicamata plant will be felt in May shipments.

Around the Market—Lead dropped again, the third consecutive week of decline. At 12.00 cents, New York, it's lowest since Aug. 14, 1950. Since the turn of the year, price has been cut 2.75 cents. Remelt aluminum ingots are off fractionally again. Tin, after a brief rally, slid back again to 93.5 cents—its lowest price in three years.

Magnesium Plants To Close

Three government-owned magnesium plants will be closed by summer, says the Munitions Board. Stockpilers have about filled their magnesium quota, and cost of production is terrific. It costs an estimated 60 cents a pound to produce magnesium at three of the currently-operating units, and about 29-30 cents a pound at the three others.

The plants, shoved into the national industrial reserve after World War II and reactivated following Korea, have produced about 123,000 tons of metal since March, 1951, and last year turned out about 80 per cent of the nation's magnesium.

Reportedly scheduled for shutdown will be the high-cost units at Spokane, Wash., operated by Pacific Northwest Alloys Inc.; at Manteca, Calif., operated by Kaiser Magnesium Co.; and at Wingdale, N. Y., operated by Nelco Metals Inc. Lower-cost units are at Velasco, Tex., operated by Dial Chemical Co.; at Canaan, Conn., operated by Nelco Metals Inc.; and at Painesville, O., operated by Diamond Magnesium Co.

The government is willing to sell any of its plants to private industry. It's no secret it would like to see another primary producer in the field. The plants use dolomite for raw material, but the silicothermic process is not presently competitive with the electrolytic plant operated by Dow Chemical Co., at its Freeport, Tex., plant.

WHAT IT TAKES TO PRODUCE 100 POUNDS OF KENNECOTT COPPER

Metals Production Climbs

Nickel production is now at an estimated rate of 149,000 metric tons annually, 10.7 per cent higher than a year ago, says the International Materials Conference. Molybdenum output in 1953 was estimated by the group at 26,000 metric tons. IMC gives these estimates of production increase from 1950 to the beginning of 1953: Copper 10 per cent, zinc 24 per cent, nickel 26 per cent, cobalt 58 per cent, tungsten 130 per cent, molybdenum, 75 per cent.

Tin Smelter Gets Aid

A new tin smelter for Bolivia is being aided by the United Nations Technical Assistance Administration. Still in experimental stages, the project encompasses hydroelectric power facilities, long-distance transmission of the power and a low temperature smelter that uses hydrogen as the reducing agent rather than carbon. One trouble will be the fact that Bolivian tin is of such low grade. When smelted at the goverment's Longhorn Smelter in Texas, the ore must be sweetened with African or Indonesian metal to get Grade A tin.

The Texas smelter will quit operations for certain by late 1954, probably sooner. It's known the Dutch who have first option on purchase of the plant, want to operate it if they can get a four-cent duty passed by Congress.

Nonferrous Briefs

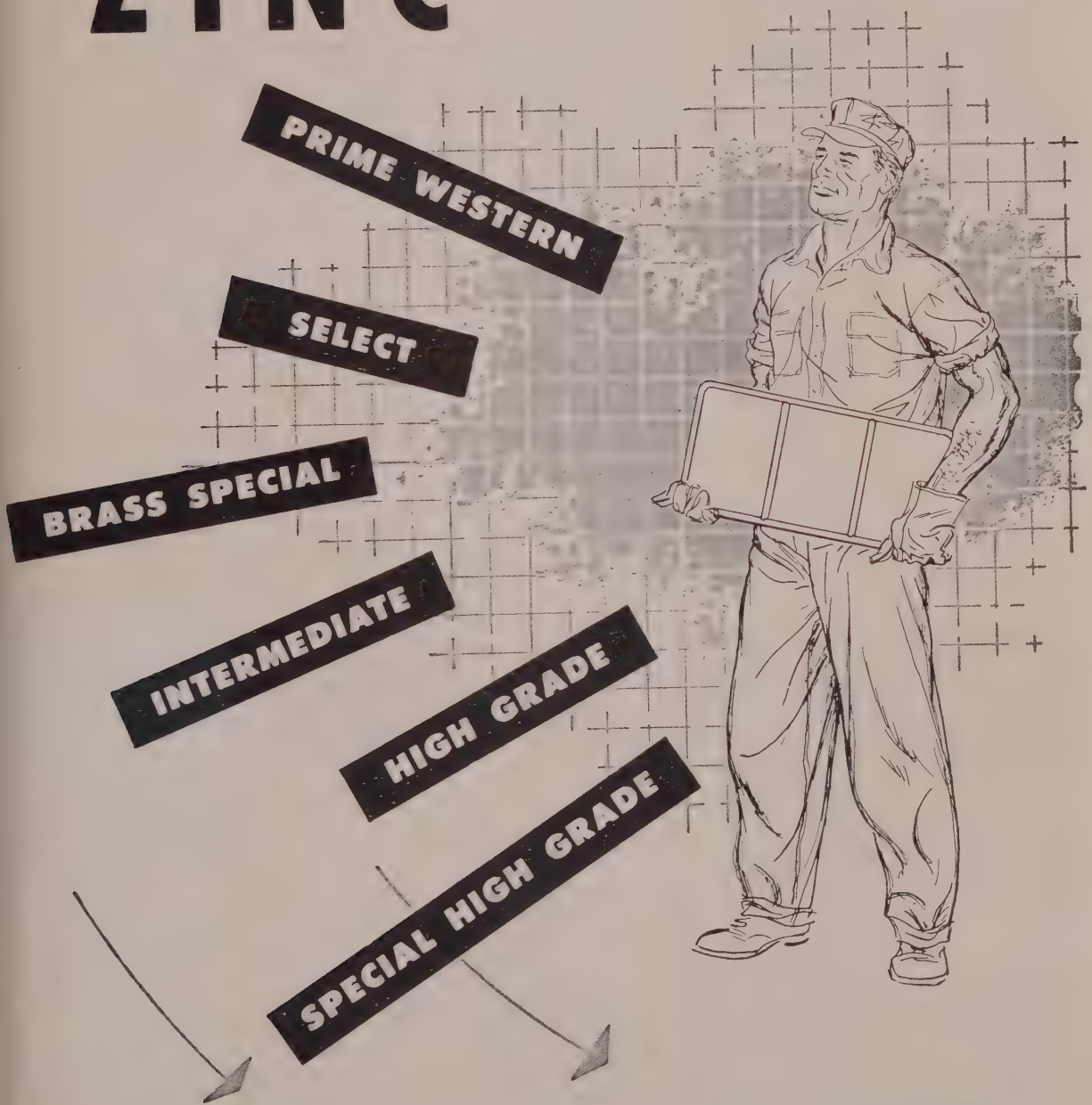
Watch for brass and wire mill prices to inch off slightly as copper prices level at 30 cents or below.

Anaconda Copper Mining Co. spent $67.8 million last year for capital expenditures on plant and equipment.

Zinc price is holding tenaciously at 11 cents, partly because the American Zinc Institute's annual meeting comes up this week.

SLAB ZINC

every grade of ZINC
for urgent military and
civilian requirements



AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

Semifinished and Finished Steel Products

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on pages 162-163.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$81.00
Munhall,Pa U5 .....54.00
Seattle S24 .....75.00
INGOTS, Alloy (NT)
Detroit R7 .....$57.00
Fontana,Calif. K1 ....83.00
Houston S5 .....65.00
Midland, Pa. C18 ....57.00
Munhall, Pa. U5 .....57.00
BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$59.00
ClairtonPa. U5 .....59.00
Ensley, Ala. T2 .....59.00
Fairfield, Ala. T2 ....59.00
Fontana,Calif. K1 ....78.00
Gary,Ind. U5 .....59.00
Johnstown,Pa. B2 ....59.00
Lackawanna,N.Y. B2 ..59.00
Munhall,Pa. U5 .....59.00
So.Chicago,Ill. U5 ....59.00
SoDuquesne,Pa. U5 ..59.00
Carbon, Forging (NT)
Bessemer,Pa. U5 .....$70.50
Buffalo R2 .....70.50
Canton,O. R2 .....70.50
Clairton,Pa. U5 .....70.50
Cleveland R2 .....70.50
Conshohocken,Pa. A3 ..77.50
Detroit R7 .....73.50
Ensley,Ala. T2 .....70.50
Fairfield,Ala. T2 .....70.50
Fontana,Calif. K1 ....89.50
Gary,Ind. U5 .....70.50
Geneva,Utah C11 .....70.50
Houston S5 .....78.50
Johnstown,Pa. B2 ....70.50
Lackawanna,N.Y. B2 ..70.50
LosAngeles B3 .....89.50
Munhall,Pa. U5 .....70.50
Seattle B3 .....89.50
So.Chicago R2,U5,W14.70.50
So.Duquesne,Pa. U5 ...70.50
So.SanFrancisco B3 ..89.50
Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$76.00
Buffalo R2 .....76.00
Canton,O. R2 .....76.00
Canton,O. T7 .....78.80
Conshohocken,Pa. A3 ..83.00
Detroit R7 .....79.00
Fontana,Calif. K1 ....95.00
Gary,Ind. U5 .....76.00
Houston S5 .....84.00
Ind.Harbor,Ind. Y1 ....76.00
Johnstown,Pa. B2 ....76.00
Lackawanna,N.Y. B2..76.00
LosAngeles B3 .....96.00
Massillon,O. R2 .....76.00
Midland,Pa. C18 .....76.00
Munhall,Pa. U5 .....76.00
So.Chicago R2,U5,W14.76.00
So.Duquesne,Pa. U5 ..76.00
Struthers,O. Y1 .....76.00
Warren,O. C17 .....76.00
ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$87.50
Canton,O. R2 .....87.50
Cleveland R2 .....87.50
Fontana,Calif. K1 ....108.50
Gary,Ind. U5 .....87.50
Massillon,O. R3 .....87.50
So.Chicago,Ill. R2 ...87.50
So.Duquesne,Pa. U5 ..87.50
SHEET BARS (NT)
Fontana,Calif. K1 ...$93.18
SKELP
Aliquippa,Pa. J5 .....3.65
Munhall,Pa. U5 .....3.55
Warren,O. R2 .....3.55
Youngstown R2, U5 ....3.55
WIRE RODS
Alton,Ill. L1 .....4.70
AlabamaCity, Ala. R2..4.325
Buffalo W12 .....4.325
Cleveland A7 .....4.325
Donora,Pa. A7 .....4.325
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 ....5.125
Houston S5 .....4.725
Johnstown,Pa. B2 ....4.325
Joliet,Ill. A7 .....4.325
KansasCity,Mo. S5 ....4.665
LosAngeles B3 .....5.125
Minnequa,Colo. C10 ...4.575
Monessen,Pa. P7 .....4.525
No.Tonawanda,N.Y.B11 4.325
Pittsburg,Calif. C11 ...4.975
Portsmouth,O. P12 ....4.525
Roebling, N. J. R5 ....4.425
So. Chicago,Ill. R2 ....4.325
SparrowsPoint,Md. B2. 4.425
Sterling,Ill.(1) N15 ....4.325
Struthers,O. Y1 .....4.325
Torrance,Calif. C11 ....5.125
Worcester,Mass. A7 ...4.625
SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ...4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 .....4.675
So.Chicago,Ill. U5 ....4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity, Ala. R2 ..3.85
Aliquippa,Pa. J5 .....3.85
Bessemer,Ala. T2 .....3.85
Bethlehem,Pa. B2 ....3.90
Clairton,Pa. U5 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 .....4.50
Gary,Ind. U5 .....3.85
Geneva,Utah C11 .....3.85
Houston S5 .....4.25
Ind.Harbor,Ind. I-2 ....3.85
Johnstown,Pa. B2 .....3.90
KansasCity,Mo. S5 ....4.45
Lackawanna,N.Y. B2 ..3.90
LosAngeles B3 .....4.45
Minnequa,Colo. C10 ....4.30
Munhall,Pa. U5 .....3.85
Niles,Calif.(22) P1 ....4.56
Phoenixville,Pa. P4 ....4.95
Seattle B3 .....4.50
So.Chicago,Ill. U5, W14.3.85
So.SanFrancisco B3 ....4.40
Torrance,Calif. C11 ....4.45
Weirton,W.Va. W6 ....4.10
Wide Flange
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fontana,Calif. K1 .....5.05
Lackawanna,N.Y. B2 ..3.90
Munhall,Pa. U5 .....3.85
So. Chicago,Ill U5 ....3.85
Alloy Stand. Shapes
Clairton,Pa. U5 .....4.725
Fontana,Calif. K1 ....6.125
Gary,Ind. U5 .....4.725
Munhall,Pa. U5 .....4.725
So.Chicago,Ill. U5 ....4.725
H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.80
Bessemer,Ala T2 .....5.80
Bethlehem,Pa. B2 .....5.80
Clairton,Pa. U5 .....5.80
Fairfield,Ala T2 .....5.80
Fontana,Calif. K1 ....6.45
Gary,Ind. U5 .....5.80
Geneva,Utah C11 .....5.80
Ind.Harbor,Ind. I-2 ....5.80
Ind.Harbor,Ind Y1 ....6.30
Johnstown,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
LosAngeles B3 .....6.35
Munhall,Pa. U5 .....5.80
Seattle B3 .....6.40
So.Chicago,Ill. U5 .....5.80
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.30
H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
Munhall,Pa. U5 .....5.75
So.Chicago,Ill. U5 .....5.75
BEARING PILES
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 .....3.85
PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.95
Bessemer,Ala. T2 .....5.95
Clairton,Pa. U5 .....5.95
Cleveland J5, R2 .....5.95
Conshohocken,Pa. A3 ....6.20
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....5.95
Fontana,Calif.(30) K1 ..6.65
Gary,Ind. U5 .....5.95
Geneva,Utah C11 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Johnstown,Pa. B2 .....5.95
Munhall,Pa. U5 .....5.95
Pittsburgh J5 .....5.95
Seattle B3 .....6.85
Sharon,Pa. S3 .....5.95
So.Chicago,Ill. U5 .....5.95
SparrowsPoint,Md. B2..5.95
Warren,O. R2 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95
PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....5.35
Coatesville,Pa. L7 .....5.75
Conshohocken,Pa. A3 ..5.55
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.25
Johnstown,Pa. B2 .....5.25
Munhall,Pa. U5 .....5.25
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.25
SparrowsPoint,Md. B2..5.25
FLOOR PLATES
Cleveland J5 .....4.95
Conshohocken,Pa. A3 ..4.95
Ind.Harbor,Ind. I-2 ....4.95
Munhall,Pa. U5 .....4.95
So.Chicago, Ill. U5 ....4.95
PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.15
Cleveland,c.l. R2 .....4.50
Warren,O., c.l. R2 ....4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.90
Aliquippa,Pa. J5 .....3.90
Ashland,Ky. (15) A10 ..3.90
Bessemer,Ala. T2 .....3.90
Clairton,Pa. U5 .....3.90
Claymont,Del. C22 .....4.35
Cleveland J5, R2 .....3.90
Coatesville,Pa. L7 .....4.35
Conshohocken,Pa. A3 ..4.35
Ecorse,Mich. G5 .....4.45
Fairfield,Ala. T2 .....3.90
Fontana,Calif.(30) K1..4.55
Gary,Ind. U5 .....3.90
GraniteCity,Ill. G4 ....4.60
Geneva,Utah C11 .....3.90
Harrisburg,Pa. C5 ....6.50
Houston S5 .....4.30
Ind.Harbor,Ind. I-2, Y1.3.90
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ..3.90
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....3.90
Pittsburgh J5 .....3.90
Seattle B3 .....4.80
Sharon,Pa. S3 .....4.15
So.Chicago,Ill. U5, W14.3.90
SparrowsPoint,Md. B2 ..3.90
Stubenville,O. W10 ....3.90
Warren,O. R2 .....3.90
Weirton,W.Va. W6 .....4.20
Youngstown R2, U5, Y1.3.90
PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.70
Geneva,Utah C11 .....5.05
PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa. B14 .....8.60
BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.95
Aliquippa,Pa. J5 .....3.95
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2 .....3.95
Clairton,Pa. U5 .....3.95
Cleveland R2 .....3.95
Detroit R7 .....4.10
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity, Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.40
Niles,Calif. P1 .....4.65
N.Tonawanda,N.Y. B11.3.95
Pittsburg,Calif. C11 ....4.65
Pittsburgh J5 .....3.95
Seattle B3, N14 .....4.70
So.Chicago R2,U5,W14 ..3.95
So.Duquesne,Pa. U5 ...3.95
So.SanFran.,Calif. B3...4.70
Sterling,Ill. N15 .....4.55
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 ....4.65
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5 ....3.95
BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.95
Atlanta A11 .....4.50
Niles,Calif. P1 .....4.65

SanFrancisco S7 .....5.00
BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.15
BARS,Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.675
Buffalo R2 .....4.675
Canton,O. T7 .....4.72
Canton,O. R2 .....4.675
Clairton,Pa. U5 .....4.675
Detroit R7 .....4.825
Ecorse,Mich. G5 .....5.025
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....4.675
Houston S5 .....5.075
Ind.Harbor,Ind. I-2, Y1.4.675
Johnstown,Pa. B2 .....4.675
KansasCity,Mo. S5 ....5.275
Lackawanna,N.Y. B2 ..4.675
LosAngeles B3 .....5.725
Massillon,O. R2 .....4.675
Midland,Pa. C18 .....4.675
So.Chicago R2,U5,W14.4.675
So.Duquesne,Pa. U5 ..4.675
Struthers,O. Y1 .....4.675
Warren,O. C17 .....4.675
Youngstown U5 .....4.675
BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.925
Gary,Ind. U5 .....4.925
Youngstown U5 .....4.925
BARS & SMALL SHAPES, H. R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.925
Bessemer,Ala. T2 ....5.925
Bethlehem,Pa. B2 .....5.925
Clairton,Pa. U5 .....5.925
Cleveland R2 .....5.925
Ecorse,Mich G5 .....6.675
Fairfield,Ala. T2 .....5.925
Fontana,Calif. K1 ....6.975
Gary,Ind. U5 .....5.925
Ind.Harbor,Ind. I-2 ...5.925
IndianaHarbor,Ind. Y1.6.425
Johnstown,Pa. B2 ....5.925
Lackawanna,N.Y. B2 ..5.925
LosAngeles B3 .....6.625
Pittsburgh J5 .....5.925
Seattle B3 .....6.675
So.Duquesne,Pa. U5 ..5.925
So.San.Francisco B3 ...6.675
Struthers,O. Y1 .....6.425
Youngstown U5 .....5.925
BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ...4.925
BeaverFalls,Pa. R2 ...4.925
BeaverFalls,Pa. M12..4.925
Buffalo B5 .....4.975
Camden,N.J. P13 .....5.375
Carnegie,Pa. C12 .....4.925
Chicago B5 .....4.925
Chicago W18 .....4.925
Cleveland A7, C20 ....4.925
Detroit P17, R7 .....5.075
Detroit B5 .....5.125
Donora,Pa. A7 .....4.925
Elyria,O. W8 .....4.925
FranklinPark,Ill. N5 ..4.925
Gary,Ind. R2 .....4.925
GreenBay,Wis. F7 ....4.925
Hammond,Ind. L2,M13.4.925
Hartford,Conn. R2 ....5.475
LosAngeles R2 .....6.375
Mansfield,Mass B5 ...5.475
Massillon,O. R2, R8 ..4.925
Monaca,Pa. S17 .....4.925
Newark,N.J. W18 .....5.375
Plymouth,Mich. P5 ...5.175
Pittsburgh J5 .....4.925
Putnam,Conn. W18 ...5.475
Readville,Mass. C14 ...5.475

St.Louis,Mo. M5 .....5.3
So.Chicago,Ill. W14 ...4.92
SpringCity,Pa. K3 ....5.37
Struthers,O. Y1 .....4.92
Waukegan,Ill A7 .....4.92
Youngstown Y1 .....4.92
Youngstown F3 .....4.92
BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....6.0
BeaverFalls,Pa. M12 ....6.0
Bethlehem, Pa. B2 ....6.0
Buffalo B5 .....6.0
Camden,N.J. P13 .....6.4
Canton,O. R2 .....6.0
Canton,O. T7 .....5.9
Carnegie,Pa. C12 .....6.0
Chicago B5 .....6.0
Chicago W18 .....6.0
Cleveland A7 .....6.0
Cleveland C20 .....6.0
Detroit P17, R7 .....6.1
Detroit B5 .....6.2
Donora,Pa. A7 .....6.0
Elyria,O. W8 .....6.0
Gary,Ind. R2 .....6.0
Hammond,Ind. L2,M13.6.0
Hartford,Conn. R2 .....6.4
Lackawanna,N.Y. B2 ..6.0
Mansfield,Mass. B5 ....6.4
Massillon,O. R2,R8 ....6.0
Midland,Pa. C18 .....6.0
Monaca,Pa. S17 .....6.0
Newark,N.J. W18 .....6.3
Plymouth,Mich. P5 .....6.2
So.Chicago,Ill. R2, W14.6.0
SpringCity,Pa. K3 .....6.2
Struthers,O. Y1 .....6.0
Warren,O. C17 .....6.0
Waukegan,Ill. A7 .....6.0
Worcester,Mass. A7 ...6.3
Youngstown Y1 .....6.0
Youngstown F3 .....6.0
BARS, Reinforcing (Fabricators
AlabamaCity,Ala R2 ...3.9
Atlanta A11 .....4.5
Buffalo R2 .....3.9
Cleveland R2 .....3.9
Emeryville,Calif. J7 ....4.7
Fairfield,Ala. T2 .....3.9
Fontana,Calif. K1 .....4.6
Gary,Ind U5 .....3.9
Houston S5 .....4.3
Ind.Harbor,Ind. I-2, Y1.3.9
Johnstown,Pa. B2 .....3.9
KansasCity,Mo. S5 ....4.5
Lackawanna,N.Y. B2...3.9
LosAngeles B3 .....4.6
Milton,Pa. B6 .....4.5
Minnequa,Colo. C10 ....4.7
Niles,Calif. P1 .....4.6
Pittsburg,Calif. C11 ....4.6
Pittsburgh J5 .....3.9
SandSprings,Okla. S5 ..4.8
Seattle B3, N14 .....4.7
So.Chicago,Ill. R2 .....3.9
So.Duquesne,Pa. U5 ....3.9
So.SanFrancisco B3 .....4.7
SparrowsPoint,Md. B2...3.9
Sterling,Ill. (1) N15 ....4.7
Struthers,O. Y1 .....3.9
Torrance,Calif. C11 ....4.6
Youngstown R2, U5 ....3.9
BARS, Reinforcing
(Fabricated; to consumers)
Huntington,W.Va. W7 ..5.5
Johnstown, ¼-1" B2 ...5.2
KansasCity S5 .....6.0
LosAngeles B3 .....5.4
Marion,O. P11 .....5.2

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div., H. K. Porter Co.
B14 A. M. Byers Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wir
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co
L7 Lukens Steel Co.

Seattle B3 N14 .....5.80
Sand Springs S5 .....6.45
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ...5.25
Williamsport,Pa. S19 ...5.35

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngt,W.Va.(3) W7 ..5.75
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....4.05
Tonawanda(3,4) B12 ..5.00
Williamsport(3) S19 ...5.25
Williamsport,Pa. S19 ...5.35

BARS, Wrought Iron (Add 4.7% to base and extras)
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt) B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ...9.60
McK.Rks.(D.R.) L5 ..13.00

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.775
Ashland,Ky.(8)A10 ...3.775
Butler,Pa. A10 .....3.775
Cleveland J5, R2 ....3.775
Conshohocken,Pa. A3 ..4.175
Detroit M1 .....4.40
Ecorse,Mich. G5 .....3.975
Fairfield,Ala. T2 .....3.775
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....3.775
Geneva,Utah C11 .....3.875
GraniteCity,Ill. G4 .....4.30
Ind.Harbor,Ind. I-2, Y1 3.775
Irvin,Pa. U5 .....3.775
Lackawanna,N.Y. B2 ..3.775
Munhall, Pa. U5 .....3.775
Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ..4.475
Pittsburgh J5 .....3.775
Sharon,Pa. S3 .....4.175
So.Chicago,Ill. W14 ...3.775
SparrowsPoint,Md. B2.3.775
Steubenville,O. W10 ...3.775
Torrance,Calif. C11 ...4.475
Warren,O. R2 .....3.775
Weirton,W.Va. W6 ....3.775
WestLeechburg,Pa. A4.3.925
Youngstown U5, Y1 ..3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.925
Dover,O. R1 .....5.825
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.675
Torrance,Calif. C11 ...5.575

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ....6.925
Ecorse,Mich. G5 .....7.475
Fontana,Calif. K1 ....7.975
Gary,Ind. U5 .....6.925
IndianaHarbor,Ind. Y1 .7.425
IndianaHarbor,Ind. I-2.6.925
Irvin,Pa. U5 .....6.925
Lackawanna(37) B2 ..6.925
Pittsburgh J5 .....6.925
SparrowsPoint(38) B2..6.925
Warren,O. R2 .....6.925
Weirton,W.Va. W6 ....7.275
Youngstown Y1 .....7.425

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 ....5.675
Conshohocken,Pa. A3 ..5.925
Ecorse,Mich. G5 .....6.225
Fairfield,Ala. T2 .....5.675
Fontana,Calif. K1 ....6.775
Gary,Ind. U5 .....5.675
Ind.Harbor,Ind. I-2 ...5.675
Ind.Harbor,Ind. Y1 ...6.175
Irvin,Pa. U5 .....5.675
Lackawanna(35) B2 ..5.675
Munhall U5 .....5.675
Pittsburgh J5 .....5.675
Sharon,Pa. S3 .....5.675
So.Chicago,Ill. U5 ....5.675
SparrowsPoint(36) B2..5.675
Warren,O. R2 .....5.675
Weirton,W.Va. W6 ....6.025
Youngstown U5 .....5.675
Youngstown Y1 .....6.175

SHEETS, Cold-Rolled Steel (Commercial Quality)
Butler,Pa. A10 .....4.575
Cleveland J5, R2 .....4.575
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.575
Follansbee,W.Va. F4 ..5.575
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.575
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2,Y1.4.575
Irvin,Pa. U5 .....4.575
Lackawanna,N.Y. B2 ..4.575
Middletown,O. A10 ....4.575
Pittsburg,Calif. C11 ...5.525
Pittsburgh J5 .....4.575
SparrowsPoint,Md. B2..4.575
Steubenville,O. W10 ...4.575
Warren,O. R2 .....4.575
Weirton,W.Va. W6 ....4.575
West Leechburg,Pa. A4..5.45
Youngstown Y1 .....4.575

SHEETS, Galv'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.075
Ashland,Ky.(8) A10 ..5.075
Canton,O. R2 .....5.075
Delphos,O. N16 .....5.675
Dover,O. R1 .....5.775
Fairfield,Ala. T2 .....5.075
Gary,Ind. U5 .....5.075
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2 ...5.075
Irvin,Pa. U5 .....5.075
Kokomo,Ind.(13) C16 ..5.475
MartinsFerry,O. W10 ..5.075
Niles,O. N12 .....6.275
Pittsburg,Calif. C11 ...5.825
SparrowsPoint,Md. B2 .5.075
Steubenville,O. W10....5.075
Torrance,Calif. C11 ...5.825
Weirton,W.Va. W6 ....5.075

SHEETS, Galvanized No. 10, High-Strength Low-Alloy
Irvin,Pa. U5 .....7.625
SparrowsPoint(39) B2..7.775

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.625
Irvin,Pa. U5 .....5.625
Kokomo,Ind.(13) C16 ..6.025
Niles,O. N12 .....6.825

SHEETS ZINCGRIP STEEL No. 10
Butler,Pa. A10 .....5.325
Middletown,O. A10 ...5.325

SHEETS, Electro Galvanized
Cleveland R2 (28) 5.925
Niles,O. R2 (28) 5.925
Weirton,W.Va. W6 ....5.775

SHEETS, Well Casing
Fontana,Calif. K1 .....5.34

RLUED Stock, 29 ga.
Yorkville,O. W10 .....7.00
Follansbee,W.Va. F4 ...7.10
Follansbee (23) F4 ....6.425

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....4.925
Gary,Ind. U5 .....4.925
GraniteCity,Ill. G4 ....5.625
Ind.Harbor,Ind. I-2 ...4.925
Irvin,Pa. U5 .....4.925
Middletown,O. A10 ....4.925
Youngstown Y1 .....4.925

BLACK PLATE (Base Box)
Aliquippa,Pa. J5 .....$6.50
Fairfield,Ala. T2 .....6.60
Gary,Ind. U5 .....6.50
GraniteCity,Ill. G4 .....6.70
Ind.Harbor,Ind. I-2, Y1.6.50
Irvin,Pa. U5 .....6.50
Niles,O. R2 .....6.50
Pittsburg,Calif. C11 ....7.25
SparrowsPoint,Md. B2 ..6.60
Warren,O. R2 .....6.50
Weirton,W.Va. W6 ....6.50
Yorkville,O. W10 .....6.50

HOLLOWARE ENAMELING Black Plate (29 gage)
Follansbee,W.Va. F4 ...6.10
Gary,Ind. U5 .....6.10
GraniteCity,Ill. G4 .....6.30
Ind.Harbor,Ind. Y1 ....6.10
Irvin,Pa. U5 .....6.10
Yorkville,O. W10 .....6.35

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.875	....
Canton,O. R2 ..	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5 ..	5.875	6.125
Ind.Harbor I-2 .	5.875	6.125
Irvin,Pa. U5 ...	5.875	6.125
Kokomo,Ind. C16	6.525	....
MartinsFy.,O.W10	5.875	....
Pittsburg,Cal.C11	6.625	....
SparrowsPt. B2 .	5.875	....
Torrance,Cal.C11	6.625	....

SHEETS, Culvert, No. 16 Pure Iron
Ashland,Ky. A10 .....6.125
Fairfield,Ala. T2 .....6.125
MartinsFerry,O. W10 ..6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier
Ashland,Ky.(8) A10 ..4.025
Cleveland R2 .....4.375
Ind.Harbor,Ind. I-2 ...4.025
Warren,O. R2 .....4.375

SHEETS, Cold-Rolled Ingot Iron
Butler,Pa. A10 .....5.075
Cleveland R2 .....5.175
Middletown,O. A10 ....5.075
Warren,O. R2 .....5.175

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ...5.325
Canton,O. R2 .....5.825

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.575
Middletown,O. A10 ....5.575

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.425

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....5.875

MANUFACTURING TERNES (Special Coated)
Fairfield,Ala. T2 .....$7.85
Gary,Ind. U5 .....7.75
Irvin,Pa. U5 .....7.75
Yorkville,O. W10 .....7.75

SHEETS, LT. Coated Ternes, 6 lb
Yorkville,O. W10 .....$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)
Gary,Ind. U5 .....$9.75
Yorkville,O. W10 .....9.75

SHEETS, Long Terne Steel (Commercial Quality)
BeechBottom,W.Va.W10 5.475
Gary,Ind. U5 .....5.475
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....5.475
Niles,O. N12 .....6.275
Weirton,W.Va. W6 ....5.475

ROOFING SHORT TERNES (8 lb Coated)
Gary,Ind. U5 .....9.75

TIN PLATE, American 1.25 lb Coke (Base Box)	1.50 lb
Aliquippa,Pa. J5 .$3.70	$8.95
Fairfield,Ala. T2. 8.80	9.05
Gary,Ind. U5 .... 8.70	8.95
Ind.Har. I-2, Y1. 8.70	8.95
Irvin,Pa. U5 .... 8.70	8.95
Pitts.,Cal. C11 .. 9.45	9.70
Sp.Pt.,Md. B2 .. 8.80	9.05
Warren,O. R2 .. 8.70	...
Weirton,W.Va.W6 8.70	8.95
Yorkville,O. W10. 8.70	8.95

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.65
Conshohocken,Pa. A3...5.90
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 .....6.75
Gary,Ind. U5 .....5.65
Ind.Harb.,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Lackawanna,N.Y. B2 ..5.70
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.65
So.SanFrancisco(25) B3.6.40
SparrowsPoint,Md. B2..5.70
Warren,O. R2 .....5.65
Weirton,W.Va. W6 ....6.10
Youngstown Y1 .....6.15
Youngstown U5 .....5.65

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.45
Cleveland A7 .....7.30
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.15
Lackawanna,N.Y. B2 ..7.90
Sharon,Pa. S3 .....7.30
SparrowsPoint,Md. B2 .7.90
Warren,O. R2 .....7.30
Weirton,W.Va. W6 ....7.95
Youngstown Y1 .....7.80

STRIP, Cold-Rolled Alloy Steel
Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....11.40
Dover,O. G6 .....11.90
Fontana,Calif. K1 ....13.30
Harrison,N.J. C18 ....12.00
Midland,Pa. C18 .....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8 12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...11.70
Youngstown C8 .....12.00

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..3.975
Warren,O. R2 .....4.325

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....5.70

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.85	9.10	9.90
BrackenridgePa. A4	...	...	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,,Ind. I-2	7.55	7.85	(34)	(41)	...
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths) ..	7.05	7.35	7.85	...	...
Vandergrift,Pa. U5	...	7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10	...	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	....	....	....
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	....	....	....
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1	...	...	8.55	10.50	....
Carnegie,Pa. S18	...	7.65	8.25	10.30	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50	....	....
Detroit D2	6.45	7.50	8.10	....	....
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6 ...	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18	...	...	8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	....
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2 ...	6.70	7.60	8.20	....	....
NewYork W3	...	7.95	8.55	10.50	12.80
Pawtucket,R.I. NS: Cleve.orPitts.Base ...	...	7.65	8.25	10.20	12.50
Worcester,Mass.,Base.	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5	...	7.95	8.55	10.50	12.80
Wallingford,Conn. W2..	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7 ..	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6 ...	5.95	7.60	8.55	10.50	12.80
Youngstown C8	...	7.65	8.25	10.20	12.50
Spring Steel (Tempered)					
Trenton,N.J. R5 (29) ..	...	...	10.30	12.50	15.35
Harrison,N.J. C18	..	...	10.30	12.50	15.35
NewYork W3	...	...	10.30*	12.50*	15.35*
Youngstown C8	...	...	10.30	12.50	15.35

* Plus 1.575 per 100 lb.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&.I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.

U4 Universal Cyclops Steel
U5 United States Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2...3.725
Alton Ill. L1 .....4.20
Ashland,Ky(8) A10 ..3.725
Atlanta A11 .....4.275
Bessemer,Ala. T2 ....3.725
Bridgeport,Con.(10)S15 4.225
Buffalo(27) R2 .....3.725
Butler,Pa. A10 .....3.725
Carnegie,Pa. S18 ....4.225
Conshohocken,Pa. A3 ..4.125
Detroit M1 .....4.40
Ecorse,Mich. G5 .....4.025
Fairfield Ala. T2 ....3.725
Fontana,Calif. K1 ....5.175
Gary,Ind U5 .....3.725
Houston,Tex. S5 .....4.125
Ind.Harbor,Ind. I-2,Y1.3.725
Johnstown,Pa.(25) B2..3.725
KansasCity,Mo.(9) S5..4.325
Lackawna N.Y. B2 B2 3.725
LosAngeles B3 .....4.475
Milton Pa. B6 .....4.35
Minnequa,Colo. C10 ...4.775
NewBritain,Conn.(10) S15 ...4.225
N.Tonawanda,N.Y.B11 3.725
Pittsburg,Calif. C11 ...4.475
Riverdale Ill. A1 .....3.725
SanFrancisco S7 .....5.00
Seattle B3 .....4.725
Seattle N14 .....4.75
Sharon,Pa. S8 .....4.225
So.Chicago,Ill. W14 ...3.725
So.SanFrancisco C10 B3 4.475
SparrowsPoint,Md. B2 3.725
Sterling,Ill. N15 .....4.725
Torrance,Calif. C11 ...4.475
Warren,O. R2 .....3.725
Weirton,W.Va. W6 ....3.825
WestLeechburg,Pa. A4 3.975
Youngstown U5 Y1 ....3.725

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10) S15 6.05
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 ....7.50
Gary,Ind. U5 .....6.10
Houston,Tex. S5 .....6.30
KansasCity,Mo. S5 ....6.70
Midland,Pa. C18 .....5.85
NewBritain,Conn.(10) S15 6.05
Sharon,Pa. S8 .....6.45
Youngstown U5 .....6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6 ...5.30
Bridgeport,Conn.(10) S15 5.80
Butler,Pa. A10 .....5.10
Cleveland A7, J5 .....5.10
Dearborn,Mich. D3 ....6.05
Detroit D2 .....5.60
Detroit M1 .....5.45
Dover,O.(40) G6 .....5.30
Ecorse,Mich. G5 .....5.30
Follansbee,W.Va. F4 ...5.10
Fontana,Calif. K1 ....7.00
Franklin Park,Ill.(40) T6 .5.35
Ind.Harbor,Ind. I-2 ....5.35
Lackawanna,N.Y. B2 ...5.10
LosAngeles C1 .....7.15
Mattapan,Mass. T6 ....5.35
Middletown,O. A10 ....5.10
NewBritain,Conn. S15 ...5.80
NewCastle,Pa. B4 .....5.80
NewCastle,Pa.(40) E3 ...5.70
NewHaven,Conn. D2 ....5.85
NewHaven,Conn. A7 ....5.60
Pawtucket,R.I. R3 ....6.45
Pawtucket,R.I.(21) NS .6.30
Riverdale Ill.(40) A1 ...5.35
Rome,N.Y. R6 .....5.10
Sharon,Pa. S8 .....5.80
SparrowsPoint,Md. B2 ...5.10
Trenton,N.J. R5 .....6.45
Wallingford,Conn. W2 ...6.30
Warren,O.(40) T5 .....5.70
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown C8 (40) 5.70
Youngstown Y1 .....5.10

STRIP, Electro Galvanized

Dover,O. G6 .....5.30
Warren,O. T3 .....5.70
Weirton,W.Va. W6 ....5.10
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.45
Riverdale,Ill. A1 .....4.30
Sharon,Pa. S8 .....4.55
Youngstown U5 .....4.15

WIRE, Merchant Quality

(6 to 8 gage)	An'ld. Galv.
AlabamaCity,Ala. R2	6.075 6.225
Aliquippa J5	6.075 6.525†
Atlanta A11	6.325 6.675
Bartonville(19) K4	6.075 6.40
Buffalo W12	5.225 ...
Cleveland A7	6.075 6.225
CrawfordsvilleMS	6.175 6.475
Donora,Pa. A7	6.375 6.225
Duluth,Minn. A7	6.075 6.225
Fairfield T2	6.075 6.225
Houston,Tex. S5	6.475 6.50
Johnstown B2	6.075 6.45†
Joliet,Ill. A7	6.075 6.225
KansasCy.Mo. S5	6.675 7.00
Kokomo C16	6.175 6.425
LosAngeles B3	7.025 ....
Minnequa C10	6.325 6.70*
Monessen P7	6.075 6.45
Palmer W12	5.525 ....
Pitts.,Calif. C11	7.025 7.175
Prtsmth.(18) P12	6.475 ....
Rankin A7	6.075 6.225
So.Chicago R2	6.075 6.325
So.S.Fran. C10	7.025 7.40*
SparrowsPt. B2	6.175 6.55†
Sterling,Ill.(1) N15	6.075 6.375
Struthers,O. Y1	6.075 6.475
Torrance,Cal. C11	7.025 ....
Worcester A7	6.375 6.525

*Based on 14c zinc; †14.50c zinc; ‡17.5c zinc.

WIRE (16 gage)

	Anl'd. Galv. Stone	Stone
(Add 4.7% on base and extras)		
Aliquippa J5	10.15	12.15
Bartonville(19) K4	10.25	12.00*
Cleveland A7	10.15	11.55
Crawfordsville MS	10.75	12.51
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.73	12.58‡
Kokomo C16	10.625†	12.325‡
Minnequa C10	10.40	12.425*
Palmer,Mass. W12	10.25	12.15
Pitts.,Cal. C11	10.60	11.90
SparrowsPt. B2	10.84	12.68‡
Sterling(1) N15	10.73‡	12.15†
Waukegan A7	10.25	11.55
Worcester A7	11.1	11.85

*Based on 14c zinc; §14.50c zinc. †Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..5.225
Aliquippa,Pa. J5 (42) ...4.85
Atlanta A11 .....5.475
Alton, Ill. L1 .....5.45
Bartonville Ill. K4 ....5.325
Buffalo W12 .....5.225
Chicago W13 .....5.475
Cleveland A7, C20 ....5.225
Crawfordsville,Ind. MS .5.325
Donora,Pa. A7 .....5.225
Duluth,Minn. A7 .....5.225
Fairfield,Ala. T2 .....5.225
Fostoria,O. (24) S1 ....5.725
Houston S5 .....5.625
Johnstown,Pa. B2 ....5.225
Joliet,Ill. A7 .....5.225
KansasCity,Mo. S5 ....5.825
Kokomo,Ind. C16 .....5.325
LosAngeles B3 .....6.175
Minnequa,Colo. C10 ....5.475
Monessen,Pa. P7 .....5.475
Newark 6-8 ga I-1 ....5.88
No.Tonawanda B11 ....5.225
Palmer,Mass. W12 .....5.525
Pittsburg,Calif. C11 ...6.175
Portsmouth,O. P12 ....5.625
Rankin,Pa. A7 .....5.225
So.Chicago, Ill. R2 ....5.225
So.SanFrancisco C10 ...6.175
SparrowsPoint,Md. B2..5.325
Sterling,Ill.(1) N15 ....5.225
Struthers,O. Y1 .....5.225
Torrance,Calif. C11 ....6.175
Waukegan,Ill. A7 .....5.225
Worcester,Mass. A7 ....5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 .....6.20
Buffalo W12 (43) 6.35
Cleveland A7 (43) 5.85
Crawfs-ville,Ind.MS(43) 5.70
Dover,O. G6 .....6.20
Fostoria,O. S1 (43) 6.00
Kokomo,Ind. C16 (43)...5.70
FranklinPark Ill. T6(43) 6.20
Massillon,O. R8 (43) ...5.85
Monessen,Pa. P16 (43) ..6.35
Monessen,Pa. P7 (43) ..6.10
Pawtkt,R.I.(12) NS (43)6.85
Trenton,N.J. R5 (43) 6.15
Worcester,Mass.A7 (43)..6.15
Worcester,Mass T6 (43)..6.50
Worcester,Mass W12(43) 6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....8.90
Monessen,Pa. P16 (43)...8.50
Muncie,Ind. I-7 (43) 8.70
Roebling,N.J. R5 (43) ..8.80
SparrowsPt.,Md. B2(43).8.60
Johnstown,Pa. B2 (43)..8.50

ROPE WIRE

Alton,Ill. L1 (43) 8.75
Bartonville,Ill. K4 .....8.95
Buffalo W12 (43) 8.55
Fostoria,O. S1 (43) 8.55
Johnstown,Pa. B2 (43)..8.55
Monessen,Pa. P16 (43)...8.55
Monessen,Pa. P7 (43) ...8.80
Muncie,Ind. I-7 (43) 8.75
Palmer,Mass. W12 (43)..8.55
Portsmouth,O. P12 (43)..8.55
Roebling,N.J. R5 (43) ...8.55
SparrowsPt. B2 (43) 8.65
Struthers,O. Y1 (43) 8.55
Worcester J4, T6 (43) ...8.55

(A Plow and Mild Plow; add 0.25c for improved plow.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43) ...6.25
Alton,Ill. L1 (43) 6.55
Bartonville,Ill. K4 .....6.64
Buffalo W12 (43) 6.25
Cleveland A7 (43) 6.25
Donora,Pa. A7 (43) 6.25
Duluth,Minn. A7 (43) ...6.25
Fostoria,O. S1 (43) 6.25
Johnstown,Pa. B2 (43)..6.25
Millbury(12) N6 (43)....8.05
Minnequa,Colo. C10(43).6.50
Monessen,Pa. P7 (43) ...6.25
Monessen,Pa. P16 .....6.75
Muncie,Ind. I-7 (43) 6.45
Palmer,Mass. W12 (43) 6.55
Pittsburg,Calif. C11(43.7.20
Roebling,N.J. R5 (43)...6.55
Portsmouth,O. P12(43)...6.25
So.Chicago,Ill. R2 (43)..6.25
So.SanFran. C10 (43) ...7.20
SparrowsPt.,Md. B2 (43)6.35
Struthers,O. Y1 (43) 6.25
Trenton,N.J. A7 (43) 6.55
Waukegan,Ill. A7 (43)...6.25
Worcester A7. T6 (43)....6.55
Worcester,Mass. W12(43)6.55
Worcester,Mass. J4 (43).6.75

WIRE Upholstery Spring

Aliquippa,Pa. J5 .....6.275
Alton,Ill. L1 .....6.50
Buffalo W12 .....6.275
Cleveland A7 .....6.275
Donora,Pa. A7 .....6.275
Duluth,Minn. A7 .....6.275
Johnstown,Pa. B2 .....6.275
LosAngeles B3 .....7.225
Minnequa,Colo. C10 ....6.525
Monessen,Pa. P7 .....6.275
Monessen,Pa. P16(42) ...6.40
NewHaven,Conn. A7 ....6.575
Palmer,Mass. W12 .....6.575
Pittsburg,Calif. C11 ...7.225
Portsmouth,O. P12 .....6.275
Roebling,N.J. R5 .....6.575
So.Chicago,Ill. R2 .....6.275
So.SanFrancisco C10 ...7.225
SparrowsPoint,Md. B2..6.375
Torrance,Calif. C11 ....7.225
Trenton,N.J. A7 .....6.575
Waukegan,Ill. A7 .....6.275
Worcester,Mass. A7 ....6.575

WIRE, Fine & Weaving (8"Coils)

Alton,Ill. L1 (43) 9.20
Bartonville,Ill. K4 .....9.42
Buffalo W12 (43) 8.90
Chicago W13 .....9.32
Cleveland A7 (43) 8.90
Crawfordsville,Ind.MS(43) 8.90
Fostoria,O. S1 (43) 8.90
Johnstown,Pa. B2 (43)..8.90
Kokomo,Ind. C16 (43).8.90
Monessen,Pa. P16 (43)..8.90
Muncie,Ind. I-7 (43) 9.10
Palmer,Mass. W12 (43).9.20
Roebling,N.J. R5 (43) ..9.20
Waukegan,Ill. A7 (43)..8.90
Worestr.Mass. A7,T6(43)9.20

WIRE, Tire Bead

Bartonville,Ill. K4 ....11.51
Monessen,Pa. P16 (43)..11.40
Roebling,N.J. R5 (43)..11.55

WOVEN FENCE, 9-15½ Ga. Col

AlabamaCity,Ala. R2 135
Ala.City,Ala.,17-18ga.R2 222
Aliqu'pa,Pa.9-14½ga.J5 130‡
Atlanta A11 140
Bartonville,Ill.(19) K4 ..137
Crawfordsville,Ind. M8 ...138
Donora,Pa. A7 133
Duluth,Minn. A7 133
Fairfield Ala. T2 133
Houston,Tex. S5 145
Johnstown,Pa. B2 138
Johnstown 17ga.,6" B2 ..229
Joliet,Ill. A7 133
KansasCity,Mo. S5 149
Kokomo,Ind. C16 140
Minnequa,Colo. C10 ....146*
Monessen,Pa. P7 138
Pittsburg,Calif. C11 156
Rankin,Pa. A7 133
So.Chicago,Ill. R2 135
Sterling,Ill. (1) N15 136

*On 14c zinc; ‡17.5c zinc.

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	140
Duluth Minn. A7	133
Franklin,Pa. F5	145
Huntington,W.Va. W7	143
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	148‡
Atlanta A11	149
Bartonville,Ill.(19) K4	146
Crawfordsville,Ind. MS	147
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	154
Johnstown,Pa. B2	145
Joliet,Ill. A7	142
KansasCity,Mo. S5	158
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10.	167*
SparrowsPoint,Md. B2	147
Sterling,Ill.(1) N15	145

*On 14c zinc; †17.5c zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill.(19) K4	132
Crawfordsville,Ind. MS	132
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

TRACK BOLTS (20) Treated

KansasCity,Mo. S5(46)	9.85
Lebanon,Pa. (31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh P14	9.85
Pittsburgh O3	10.60

AXLES

Ind.Harbor,Ind. S13 ....5.65
Johnstown,Pa. B2 .....5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	127
Aliquippa,Pa. J5	127
Atlanta A11	130
Bartonville,Ill. (19) K4	127
Chicago,Ill. W13	127
Cleveland A9 (44)	125
Crawfordsville,Ind. MS	127
Donora,Pa. A7	127
Duluth,Minn. A7	127
Fairfield,Ala. T2	127
Galveston,Tex. D7	135
Houston,Tex. S5	135
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity,Mo. S5	139
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127

To dealers & mfrs. (7)	Col.
So.Chicago,Ill. R2	127
SparrowsPt.Md. B2	129
Sterling,Ill.(1) N15	127
Torrance,Calif. C11	147
Worcester,Mass. A7	133

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	129
Bartonville,Ill. (19) K4	126
Chicago W13	127
Crawfordsville,Ind. M8	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
Kokomo,Ind. C16	128
Minnequa,Colo. C10 (45)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	145
Portsmouth,O. P12	132
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
SparrowsPt.,Md. B2	128
Sterling,Ill.(1) N15	126
Torrance,Calif. C11	146
Worcester,Mass. A7	132

NAILS, Cut (100 lb keg) to dealers (33)

Conshohocken,Pa. A3 ..$7.80
Wheeling,W.Va. W10 ...7.80

TIE PLATES

Fairfield,Ala. T2 .....4.775
Gary,Ind. U5 .....4.775
Ind.Harbor,Ind. I-2 ...4.775
Lackawanna,N.Y. B2 ..4.775
Minnequa,Colo. C10..$95.50*
Pittsburg,Calif. C11 ...4.925
Seattle B3 .....4.925
Steelton,Pa. B2 .....4.775
Torrance,Calif. C11 ...4.925
* Per net ton.

JOINT BARS

Bessemer,Pa. U5 .....4.925
Fairfield,Ala. T2 .....4.925
Ind.Harbor,Ind. I-2 ....4.925
Joliet,Ill. U5 .....4.925
Lackawanna,N.Y. B2..4.925
Minnequa,Colo. C10 ....4.925
Steelton,Pa. B2 .....4.925

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1.6.65
KansasCity, Mo. S5 ....6.90
Lebanon,Pa. B2 .....6.65
Minnequa,Colo. C10 ....6.65
Pittsburgh J5 .....6.65
Seattle B3 .....7.15
So.Chicago, Ill. R2 ....6.65
Struthers,O. Y1 .....6.65
Youngstown R2 .....6.65

RAILS

	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675	....	4.25
Fairfield,Ala. T2	....	....	....	4.25
Gary,Ind. U5	3.775	3.675	3.725	...
Huntington,W.Va. W7	....	....	....	5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	...
Johnstown,Pa. B2	....	....	...(16)	4.25
Lackawanna,N.Y. B2	3.775	3.675	....	4.25
Minnequa,Colo. C10	$75.50*	$73.50*	....	4.75
Steelton,Pa. B2	3.775	3.675	....	...
Williamsport,Pa. S19	....	....	....	5.00

*Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.65-1.66
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025
9	3.25	0.5	....	1.01

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.05c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.
(46) Plus 2.2 per cent.

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft.	8.5c		11.5c		17c		23c		27.5c		37c		58.5c		76.5c							
Pounds Per Ft.	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62							
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.5	15.25	35.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25						
Alton, Ill. L1 (†)	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5						
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75						
Etna, Pa. N2 (†)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75						
Fontana, Calif. K1 (†)	19.5	0.25	22.5	4.25	25	7.75	25.5	7.5	26	8.5	26.5	9	27	8.75	27	8.75						
Ind. Harbor, Ind. Y1 (†)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75						
Lorain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25						
Sharon, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75						
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75						
Youngstown R2 (**)	32.5	16.25	35.5	20.25	38	23.75	38.5	22.75	39	23.75	39.5	24.25	40	23.25	40	23.25						
Youngstown Y1 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25						

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (**)	24	8.25	27	9.75	27	9.75	29	11.75	29	11.75	33.75	16.5	33.75	16.5

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft	5.5c		6c		6c		9.2c		$1.09													
Pounds Per Ft	0.24		0.42		0.57		9.20		10.89													
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv												
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25												
Butler, Pa. F6 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....												
Etna, Pa. N2 (†)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25												
Sharon, Pa. M6 (‡)	29.5	—1.75	23	+2.25	18	+5.25	..	....	..	....												
Sharon, Pa. S4 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....												
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....												
Youngstown R2 (**)	...	...	...	...	...	...	33	15.75	33	15.75												
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....												

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 12.50c; (**), 11.50c; (*), 5c, with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14.19	16.71–17.77	16.20	16.20
1¼	13	16.97	19.80–21.26	16.46	19.19
1½	13	18.22–18.77	22.08–22.82	18.19	21.41
1¾	13	20.35–21.35	24.92–25.49	20.69	24.35
2	13	22.81–23.93	27.94–28.58	23.19	27.28
2¼	13	25.69–26.86	31.38–32.18	25.84	30.42
2½	12	28.40–29.36	34.55–35.58	28.46	33.50
2½	12	31.28–32.17	37.83–39.19	31.19	36.67
2¾	12	33.87–34.82	40.09–42.44	33.05	38.86
3	12	35.78–36.87	42.11–44.93	34.98	40.82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	11
⅝-in. & ⅝-in.	15
¾-in. and larger	14
Longer than 6 in.:	
All diams.	8
Lag bolts, all diams.:	
6 in. and shorter	19
over 6 in. long	16
Ribbed Necked aCrriage	15
Blank	30
Plow	30
Step, Elevator, Tap and Sleigh Shoe	18
Tire Bolts	8
Boiler & Fitting-Up Bolts	28

NUTS

H.P. & C.P.	Reg.	Hvy.
Square:		
½-in. & smaller	10	10
⅝-in. & ⅝-in.	8	1
¾-in.-1½-in.	4	+4
1⅝-in. & larger	22	1
H.P. Hex.:		
½-in. & smaller	12	+3
⅝-in. & ⅝-in.	8	+3
¾-in.-1½-in.	4	+3
1⅝-in. & larger	4	+3
C.P. Hex.:		
½-in. & smaller	22	18
⅝-in. & ⅝-in.	19	13
¾-in. & 1½-in.	15	8
1⅝-in. & larger	2	+4

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	33	26
⅝-in. & ⅝-in.	27	19
¾-in.-1½-in.	21	11
1⅝-in. & larger	5	list
		Light
⅞-in. & smaller	33	26
½-in. to ⅝-in.		26
¾-in. to 1½-in.		18

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	37
1 in. and smaller diam. x over 6 in.	24

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼-in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	40
¾-in. through 1 in.	26
Longer than 6 in.:	
⅝-in. and smaller	24
¾-in. through 1 in.	2

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.50c
⅞-in. under .....40 off

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	10.90
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	.83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots.	78.00
Brass, 20-ton lots.	30.00-39.00
Bronze, 10-ton lots	.52.25-60.00
Copper:	
Electrolytic	45.75
Reduced	.12.75*
Lead	7.50*
Magnesium	.75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	48.50
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	87.00
Zinc, 10-ton lots.	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

* Plus cost of metal.

STAINLESS STEEL

(Add 4.7% to extras where new extra cards have not been issued)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	44.25	36.50	33.75
302	44.50	39.75	34.00
303	46.50	43.50	36.50
304	46.50	41.75	35.50
309	60.50	59.25	48.25
316	61.50	63.50	53.00
321	53.00	52.00	40.00
347	58.00	56.50	44.75
410	39.00	32.75	27.50
416	40.00	40.00	28.00
420	47.00	50.25	33.50
430	41.50	33.25	28.00
501	29.25	27.75	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa. sheets and strip except Types 303, 309, 416 420, 501 & 502 A10

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Harrison, N. J., wire, Type 302, 33.00c; Type 304, 34.50c; Type 316, 51.50c, including 4.7% increase.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip except Types 303, 309, 416, 501 502 and 34.25c on Type 301 S3.

So. Chicago, bars, shapes U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, strip A4.

Youngstown, strip C8.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Copper Base Both Sides
302	....	....	19.75	26.24-27.50	77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00	....	.....	....
310	36.50	41.00	....	.....	144.00
316	29.50	34.00	26.00	35.92-36.50	....
317	34.50	39.00	....	.....	....
318	33.50	38.00	....	.....	....
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75	....	.....	....
410	20.75	27.25	....	.....	....
Nickel	33.55	45.15	....	.....	....
Inconel	41.23	54.18	....	.....	165.00
Monel	34.93	46.28	....	.....	....
Copper*	....	....	....	44.00	....

Strip Carbon Base	Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Nickel	41.00	54.00	....	....
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatsville L7; nickel. copper-clad strip, Carnegie, Pa. S18 Production point for copper-base sheets is Carnegie, Pa. A13.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	5.81	7.17	7.38	6.42	...	6.41	7.43	11.27	6.47	6.47	7.70
Boston	6.51	7.35	8.39	6.55	...	6.42	7.49	12.37	6.56	6.75	7.98
Buffalo	5.80	6.65	8.31	6.21	...	5.90	6.95	11.07	6.08	6.30	7.67
Birmingham	5.80	6.65	7.70[3]	5.80	...	5.80	7.85	...	5.95	6.10	8.15
Chicago	5.80	6.65	7.90	5.83	...	5.83	6.80	10.65	5.95	5.95	7.18
Cincinnati	6.13	6.72	8.21	6.14	...	6.13	7.16	10.97	6.42	6.47	7.60
Cleveland	5.80	6.65	8.04	6.00	...	5.89	6.90	10.79	6.28	6.12	7.51
Detroit	6.23	6.46	8.44	6.08	7.495	6.12	7.10	10.92	6.42	6.47	7.52
Houston	6.74	...	8.65	6.89	...	6.98	...	...	6.82	6.78	8.16
JerseyCity,N.J.	6.26	7.27	8.32	6.56	..	6.59	7.53	9.54	6.39	6.60	8.01
Los Angeles	6.60	8.45	8.45	6.75	11.20	6.60	8.60	12.05	6.60	6.70	8.90
Milwaukee	5.97	6.82	8.07	6.00	...	6.00	7.07	10.82	6.12	6.12	7.35
Moline, Ill.	6.16	7.00	8.25	6.19	...	6.18	7.16	...	6.30	6.30	...
New York	6.26	7.37	8.32	6.56	...	6.69	7.63	11.14	6.49	6.70	8.11
Newark, N. J.	6.62	7.41	8.53	6.56	...	6.59	7.71	...	6.39	6.60	7.18
Norfolk, Va.	7.60	...	...	...	...	6.44	8.70	...	7.25	6.64	7.33
Philadelphia	6.16	7.18	7.70	6.50	8.30	6.47	7.50	10.89	6.22	6.29	7.42
Pittsburgh	5.80	6.65	7.90	5.94	...	5.83	6.66	10.65	5.95	5.95	7.18
Portland, Oreg.	7.80	9.05	9.30	7.50	...	7.25	9.40	...	7.25	7.05	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.63	...	6.58	6.68	7.80
St. Louis	6.10	6.94	8.20	6.14	...	6.13	7.20	10.95	6.35	6.35	7.58
St. Paul	6.47	7.31	8.56	6.50	...	6.49	7.57	...	6.61	6.61	7.84
San Francisco	6.90	8.20	9.45	6.75	...	6.65	8.40	12.00	6.50	6.75	8.90
Seattle-Tacoma	7.36	8.24	9.40	7.45	...	7.08	9.37	12.00	6.83	7.19	9.10
Spokane (city)	7.80	9.40	10.15	7.15	...	7.10	9.70	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.03	...	6.93	6.95	8.17

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [3]—500 to 1499 lb; [5]—1000 to 1999 lb.

Warehouses Hampered in Balancing Stocks

Demand continues heavy for such products as sheets, heavy plates, large-sized bars, structurals. At least one producer cuts distributors' allocations to 55 per cent of normal

Cleveland—With order volume holding up, district warehouses continue to meet with difficulty attaining balanced inventories. Over-all stocks are increasing, but in products in most popular demand, such as hot and cold-rolled sheets, heavy plates, large-size bars, and structurals, the supply pinch persists.

Further difficulty is expected in this regard as result of the closing down of No. 2 open-hearth shop at the Homestead Works of United States Steel Corp. Some distributors expect their projected June receipts from this producer will be down drastically, and there is no other source for them to turn to make up the loss.

April order volume compares well with that of the preceding month despite the fewer days. Mill receipts have been fairly satisfactory so far this month.

Pittsburgh — Prospect of balanced inventories for district warehouses seemed to fade with announcement one producer would give them about 55 per cent of their normal allocations. Products hit will be structurals, plates, and surprisingly, galvanized sheets. Warehouses report a rising demand for corrugated galvanized sheets. Biggest pinch for warehouse customers will be felt about June.

Chicago—Steel warehouses are able to gain inventory on only a few items and these are the ones in comparatively soft demand, such as galvanized sheets, wire products and small bars. Short supply and bad size balance continue. It would appear household appliance makers are not pressing as hard for tonnage as they were recently, but other consuming lines show no change.

Cincinnati — Some distributors are complaining that their inventories are a shade more broken. Business continues good with demand holding for cold-rolled sheets and structurals. Sheet inventories are much lower than distributors like them to be. Coated sheets are coming through nicely for some warehouses. Buyers can get just about all the hot-rolled strip they want, but there are not many takers.

Philadelphia — On a daily basis, warehouse business is being maintained. But April, a shorter month, may lag behind March. Bars, shapes and hot and cold-rolled sheets are in tightest supply, with plates, among the major products, easier at the moment.

San Francisco—Some warehouses report business is better than it has ever been, but it could still be improved upon if they had more supplies of hot-rolled and cold-rolled sheets, channels, plates, heavy rounds and larger sizes of tubular goods.

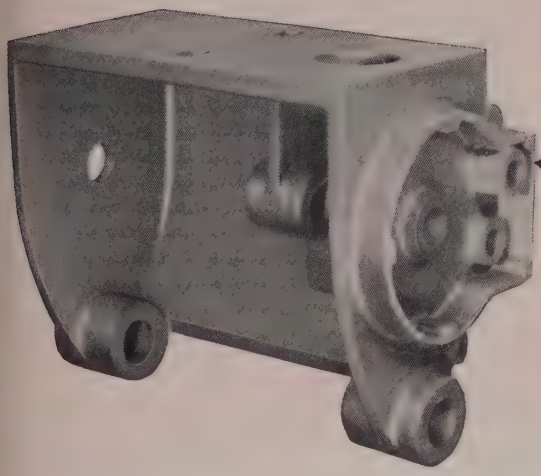
Los Angeles — Fabricators have a better chance of getting steel from warehouses than at any time in recent history. Distributors' stocks of hot-rolled sheet, galvanized sheet, continuous welded tubing, smaller sized bars, and structural shapes in bar sizes are improving. Plates, especially in lighter gages, are trickling into distributors' plate bins, which have been completely empty for the past 6 to 8 months.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 162

Los Angeles—"Unfreezing" the ban on military construction plus start of a $44 million Pacific Gas & Electric Co. power construction project at Morro Bay, boosted valuation of engineering construction for southern California, southern Nevada, and Arizona, in March to $67,833,228, highest in history, and 530 per cent higher than in March last year.

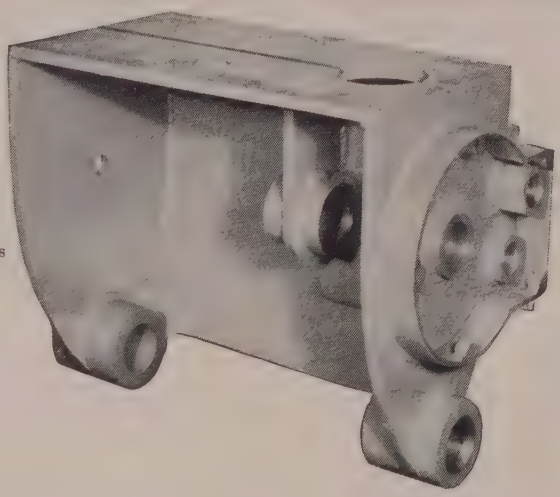
Seattle—Rolling mills here are operating at capacity but effect of the strike at fabricating and metalworking plants is expected to be felt soon. Already a slowing down in demand from the warehouse trade is noted.



Gearbox for power-driven saw, as cast in Gray Iron.

45% SAVED...
on original cost of part

41% SAVED...
on machine and labor expense



Fabricated gearbox, which was replaced by the cast design.

By redesigning in Gray Iron, it is often possible to effect substantial cost savings. Here is a striking example:

> The manufacturer of a large power-driven metal saw found that the cost of a fabricated gearbox (right above) was out of line from a competitive standpoint. Designs for a suitable Gray Iron casting were requested and approved. Result:—the Gray Iron casting is effecting a saving of 45% on original cost of the part, plus a saving of 41% on machine and labor expense.

Doesn't this suggest that it's time to analyze *your* costs on certain fabricated parts—with a view to producing them better and more economically in Gray Iron? Write for technical information on the many advantages of the Gray Iron casting process.

GRAY IRON Characteristics Include:

- Castability
- Rigidity
- Low Notch Sensitivity
- Wear Resistance
- Heat Resistance
- Corrosion Resistance
- Durability
- Vibration Absorption
- Machinability
- Wide Strength Range

Make it Better with Gray Iron • **Second largest industry in the Metal-working field**

GRAY IRON FOUNDERS' SOCIETY, INC.
NATIONAL CITY E. 6th BLDG. CLEVELAND 14, OHIO

A-1033

EASTON

EASTON experience covers small and large capacity furnace cars for every requirement.

Furnace Cars

Electric furnace car mounted on electric transfer car for completely automatic continuous heat treating system.

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH

Special Washers { ANY METAL ANY SIZE ANY QUANTITY

OVER 15,000 SETS OF TOOLS AT YOUR DISPOSAL

THE Master Products Co.

6400 PARK AVENUE • Diamond 1-1740 • CLEVELAND 5, OHIO

Sheets, Strip . . .

Sheet and Strip Prices, Page 163 & 164

New York—District sheet consumers are scrambling for tonnage. Their situation in some cases has been made unexpectedly difficult by the readjustments in schedules having to be made by the leading Pittsburgh producer as a result of recent labor disturbances; and also by the necessity of its having to close one open hearth department, with an annual capacity of 1 million tons—apparently for good.

Not only are schedules having to be re-arranged for the current quarter but the arranging of schedules for the third quarter is having to be deferred.

Consumers depending at least in part on this supplier are turning more to importers for tonnage to help round out their needs, as domestic mills generally are loaded to the hilt insofar as tonnage for the remainder of this quarter is concerned.

Boston—Heavy buying of sheets, notably cold-rolled, by the automobile industry and suppliers, is filling third quarter schedules as far as producers are willing to accept orders.

Fabricators of small tanks have bought foreign hot-rolled sheets, mostly 12-gage, and there are shortages of wide bands for conversion into sheets.

Philadelphia — Sheet demand is brisk with no early letup in prospect, especially for hot and cold-rolled sheets, electrical sheets and enameling stock. Only noticeable lag appears in galvanized and hot narrow strip, but even in these lines business is far from poor.

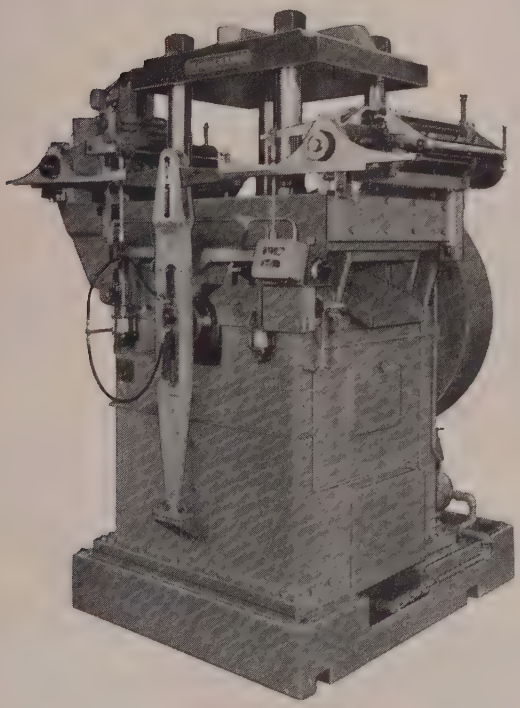
Sheet mills anticipate an easing in pressure once the vacation season sets in, particularly in July. However, they still believe they will have all the business they can handle in the grades which are now particularly active. Actually, they point out, they are having to blank out July, or most of it, in order to get caught up on arrearages.

Pittsburgh—Barring an all-out automotive strike, don't look for an early end to conversion. Demand for hot and cold-rolled sheets has zoomed in the Pittsburgh district. Automotive demand hasn't shown any signs of diminishing.

One large sheet and strip producer is sending some coils outside for annealing. A sheet hungry customer will take hot bands if they are available at a $40 premium.

Adding to the misery of sheet and strip users is the cutback in allocations announced by United States Steel Corp. Converters and ware-

A PROFIT WITH EVERY STROKE



Our customers say that. It figures. One Dieing Machine does the work of five to ten conventional stamping presses. One stroke—a complete part. One inspection. One trip for parts removal. Speed—you can pull out the throttle. Die life—longer for two reasons. (1) Stability, minimum vibration, extreme precision of tools alignment. (2) Dies take less of a beating; less metal needs to be removed for sharpening. Our men can give you the whole Dieing Machine story. If you want to cut costs, now's the time to talk to one of them—a note from you will have an H & W man on deck promptly.

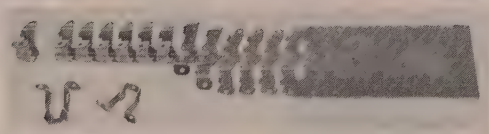
NEW CATALOG Up-to-the-minute facts on Dieing Machines. Capacities now range from 25 tons to 2500 tons. Catalog gives specifications up to 400-ton machine. Write Henry & Wright, 441 Windsor St., Hartford, Connecticut.

HENRY & WRIGHT

DIVISION OF EMHART MFG. CO.

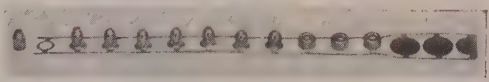
HARTFORD 1, CONNECTICUT

TYPICAL JOBS THAT SHOW A PROFIT AT EVERY STROKE



Automotive stamping produced complete per stroke from 5/32" thick by 13" wide hot rolled steel in coils on 200-ton Dieing Machine, single gear type, equipped with progressive die. Speed approximately 45 strokes per minute.

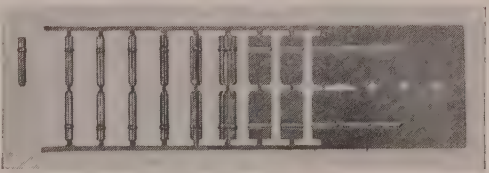
Ball bearing retainer produced complete in 75-ton Dieing Machine operating at speed of 95 strokes per minute. Made from 4⅜" wide by .034" thick cold rolled steel.



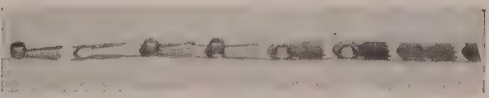
Ferrule. One completed piece produced per stroke in 50-ton Dieing Machine operating at speed of 90 strokes per minute. Made from 9/16" diameter by ⅞" long by .030" thick cold rolled steel.

C-Clamp Frame. Both halves produced complete in 150-ton Dieing Machine operating at speed of 65 strokes per minute. Material—cold rolled steel .086" by 4⅝" wide.

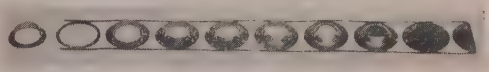
Support bracket produced complete one per stroke in 150-ton Dieing Machine operating at speed of 60 strokes per minute. Made from .062" thick by 7¼" wide cold rolled steel.



Radio tube prong produced complete in 25-ton Dieing Machine at rate of 450 pieces per minute. Made from brass .012" by 1 7/16" wide.



Bathroom fixture produced in 60-ton Dieing Machine operating at speed of 100 strokes per minute. Made from .032" thick by 1¾" wide cold rolled steel.



Hardware item. One completed piece produced per stroke in 100-ton Dieing Machine operating at speed of 75 strokes per minute. Made from 3" wide by .040" thick cold rolled steel.

en Talgo...

el tren de mañana

CIRCLE L

LEBANON Castings are at work

SPANIARDS marvel at these Talgos that flash by on the Madrid to San Sebastian run. Developed by Spanish and United States designers, built by American Car & Foundry Company, the Talgos are more than streamliners. They are an entirely new concept in railroading! The economical, light-weight Talgos hug the rails, safely rounding curves at 80 to 90 MPH, reaching 130 MPH on the straight-a-ways. And *all* the alloy castings in these remarkable trains are Lebanon CIRCLE Ⓛ . . . 22 for each train*.

In programs requiring creative effort you'll find Lebanon engineers and metallurgists working directly with the designers to produce castings with outstanding characteristics. Such a program created *the Talgo . . . el tren de mañana!*

See—STEEL WITH A THOUSAND QUALITIES—37 min., full color sound film on the making of steel castings. For information write: Dept. B, Lebanon Steel Foundry.

*Made of CIRCLE Ⓛ 205, a light-weight, strong and tough alloy. Typical castings are illustrated above.

LEBANON Castings

CARBON, SPECIAL ALLOY AND STAINLESS STEEL

CIRCLE L

LEBANON STEEL FOUNDRY LEBANON, PA.

housemen, while entitled to quotas on a monthly basis, must share in any loss. Since warehouse demand and converter requirements must be filled within the month, they were the first to feel the pinch.

Cleveland—With substantial carryover expected from second to third quarter, sheetmakers will be under pressure through the summer despite vaction shutdowns which will result in some curtailment in consumption.

Automotive requirements continue as strong as ever, and these appear to be the key to the supply situation. So long as auto needs hold up not much open time in rolling schedules is likely to develop. Unless cancellations appear there is little likelihood consumers will be able to obtain much tonnage over and above quotas for months to come. Even should a Korean truce be worked out it is not thought much change will result in supply conditions.

Sheet buyers are watching the market closely for developments pricewise. Statements by leading steel company executives hint of possible advances in the wind.

Chicago — Consumers are being given third quarter sheet and strip quotas equal to those in second quarter. However, unless sheetmakers get cancellations deliveries will run from one to four weeks late. This is indicative of demand as gaged at this point. Some strip makers are being asked to increase their quarter shipments of strip for cartridge cases by one-third.

Birmingham—Little change is noted in overall demand for sheets. Production is not sufficient to take care of demands created by large scale industrial expansion in the territory served by local producers.

Los Angeles—Trade observers estimate that fabricators generally will have no better, even less, chance of getting flat-rolled tonnage in third quarter than they did in second quarter. Kaiser Steel Corp. third quarter cold-rolled strip books are filling fast.

San Francisco—Mill buyers are absorbing heavy tonnages of galvanized sheets, but the quotas to warehouses appear more than ample to take care of the wants of small shops.

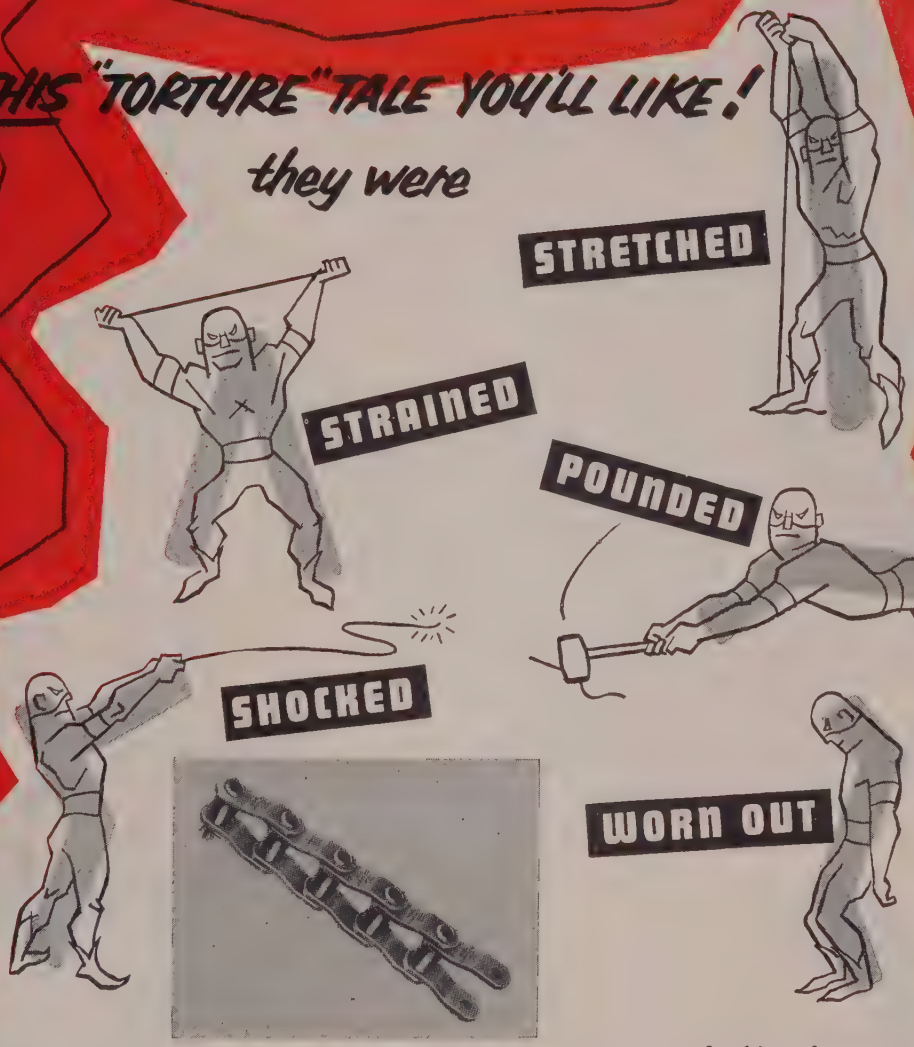
Semifinished Steel . . .

Semifinished Prices, Page 162

San Francisco—Bethlehem Pacific Coast Steel Corp.'s South San Francisco plant produced 26,271 ingot tons of steel in March, an all-time monthly record. Including the company's Los Angeles and Seattle plants, output was 86,384 tons, also a new peak and compared with rated capacity of 75,000 tons a month.

THIS "TORTURE" TALE YOU'LL LIKE!

they were



...and subjected to every conceivable test that a modern engineering "torture chamber" could devise. From it came a great new line of improved Rex Chabelco Steel Drive and Conveyor Chains. It wasn't easy because, as Chabelco users know, the previous Chabelco Chains were "tough," strong...hard to beat. But by making a few important design and manufacturing changes, Rex engineers produced a line of improved standard drive and conveyor chains. We call them Rex Chabelco "R" Series Drive and "RR" Series Conveyor Chains! You'll call them the best chains you've ever used!

Why not have your Rex Field Sales Engineer give you the complete story. Chain Belt Company, 4660 W. Greenfield Avenue, Milwaukee 1, Wisconsin.

CHAIN BELT REX COMPANY

Chain Belt COMPANY OF MILWAUKEE

® Atlanta • Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Dallas Denver • Detroit • El Paso • Houston • Indianapolis • Jacksonville • Kansas City • Los Angeles • Louisville Midland, Texas • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Portland, Ore. Springfield, Mass. • St. Louis • Salt Lake City • San Francisco • Seattle • Tulsa • Worcester

Distributors located in principal cities in the United States and abroad
EXPORT OFFICES: Milwaukee and 19 Rector Street, New York City

Plates . . .

Plate Prices, Page 162

Philadelphia — Two plate producers are scheduled to open third quarter books for civilian tonnage this week on a monthly basis. One, the leading Pittsburgh producer, recently suffered severe setbacks due to strikes and the necessity of closing down one open-hearth department at Homestead. This department, with annual capacity of 1 million tons, will not be placed in operation again.

As a result, this producer has had to delay opening third quarter books for commercial tonnage, and also has been compelled to push back current quarter schedules.

The other producer, Claymont, has been delayed because of the necessity of installing and breaking in new equipment.

Boston—No easing in supply of heavy and wide plates is in sight and there is some tightening in light and narrow stock.

Tank builders are operating with smaller inventories and are scheduling close to available plate tonnage. Small tank orders are holding well with usual seasonal improvement expected to tax procurement of plates to meet demand. This may mean continuance of plate production on strip mills longer than expected. Limit to ⅜ inch or over on wider plate mills, 105-inch and wider continues.

Pittsburgh—Most customers indicate they want substantially the same tonnage for third quarter as they requested for second, but the mills are not yet able to evaluate the entire supply picture.

Cincinnati — Steady demand pressure appears to be building up with mills running behind on deliveries and orders being carried over to the third quarter. Third quarter order books show indications of being full with the possibility of some carryover. Automotive and household appliance concerns are applying much of the pressure.

Chicago—For some mills, plates are equally as tight as sheets and no easing is in sight. Demand for light plate rolled on strip mills is not quite as strong as recently but pressure for heavy material is undiminished.

Birmingham—Need for plates is not likely to be fully satisfied so long as large users continue to order in volume.

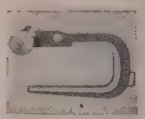
Seattle—Plate fabricators are hoping for speedy settlement of labor disputes currently hampering operations. Major tonnages are involved in two proposed oil refineries in Washington state.

Producers Pare Stamping Costs

Modern Coil Handling Equipment Widens Use of Low Cost Coil Stock

The battle to keep down costs is going well for producers of stampings. Coil stock and modern coil handling equipment are the decisive factors. Coil stock, with only two scrap ends to its entire length is far more economical than strips of straight stock with two scrap ends to every ten feet. Moreover, the type of coil loading and handling equipment built by F. J. Littell Machine Co. makes coil stock easier to handle than straight stock. Stamping producers are taking full advantage of these developments. Coil stock and Littell Coil Hooks, Reels, Straightening Machines and Automatic Roll Feeds are in wider use today than ever before.

Hooks Serve Two Ways



. . . Littell Hooks make it a simple matter to unload coils on delivery, and to load reels. The variety of sizes have lifting capacities from 1,000 to 40,000 pounds.

Two Types of Reels . . .

Littell Coil Cradle Reels mount heavy coils, up to 30,000 pounds. Spindle Reels handle coils up to 40,000 pounds. Each type is available in plain or motor driven designs.

Straighteners Flatten Stock... Removing curvature from coil stock as it passes from reel to punch press die is the function of Littell Straightening Machines. All models are the same basic design. Variation is in the number and diameter of straightening rollers employed . . . from 1″ to 90″ in width, and from .010″ to .125″ thickness.

Automatic Roll Feeds . . . Press output in many shops has been multiplied five times by simply attaching Littell Roll Feeds to presses for blanking, drawing, piercing, or cut-off work. The Littell Roll Feed is used with compound dies, single station dies, and progressive dies. Standard models are easily attached, serve all types of presses, and handle all standard widths and thicknesses of stock.

Descriptive details and prices on Littell Hooks, Reels, Straighteners and Roll Feeds are available on request. Inquiries are given immediate attention when addressed to

F. J. Littell Machine Co.
4103 N. RAVENSWOOD AVE.
CHICAGO 13, ILL.

"He Might Need It..."

"He never was much for letter-writing when he was in college. But he must know how anxious Mother and I are . . . now that he's off in Korea. Haven't heard from him in six weeks. Of course, they say 'no news is good news' . . . but I wonder. Maybe he can't write . . . because . . . maybe he's in a hospital somewhere. And maybe he needs blood. I don't know . . . but I'm not taking any chances. That's why *I'm* giving blood."

★ ★ ★

Yes, all kinds of people give blood —for all kinds of reasons. But whatever *your* reason, this you can be sure of: Whether your blood goes to a combat area, a local hospital, or for Civil Defense needs— this priceless, painless gift will some day save an American life!

Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM

A PUBLIC SERVICE PROJECT THE ADVERTISING COUNCIL

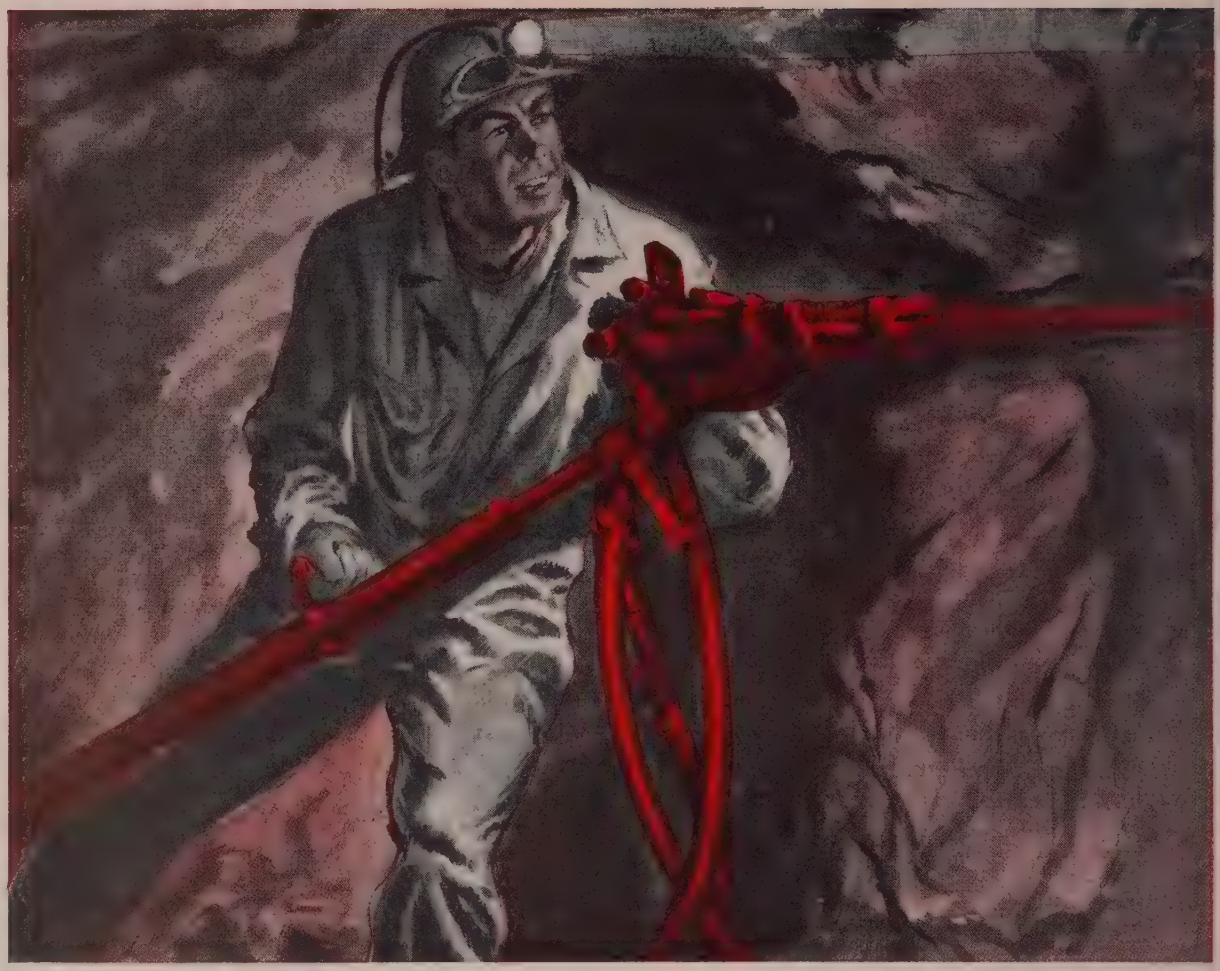
Business Executives!

✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of cooperation?
- ☐ Was information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*



Digging for buried treasure

In the search for faster, better ways of digging out the earth's many mineral treasures, designers of mining machines and equipment are finding OSTUCO Tubing the ideal solution to countless problems.

Drill posts, augers, conveyors, roof jacks, seam cutters, elevators, fans, power shovels, and draglines are but a few of the items that can be and are being improved by OSTUCO Tubing in the form of bits, shafts, rolls, supports, hydraulic and air cylinders, weldments, bushings, sleeves, spacers, handles, bearings and the like. Strength, rigidity, light weight, unlimited design flexibility and low cost are some of the reasons why engineers in this industry, as in practically every field, specify OSTUCO Seamless or Electric Welded Steel Tubing. They know they can count on OSTUCO for consistent highest quality, and they like the convenience of OSTUCO's Single Source Service, made possible by manufacturing, forging and fabricating all at one plant.

It will pay you to consult our experienced engineers about OSTUCO Tubing for your current needs or for redesigning your products to meet future competition.

From Your Blueprint . . . to Your Product
OSTUCO TUBING
Tapering • Swaging • Flanging • Bending
Upsetting • Expanding • Reducing • Beading
End closing • Spinning • Drilling • Slotting
Notching • Flattening • Shaping • Trimming
Threading • Angle Cutting • And Many Others

THE OHIO SEAMLESS TUBE COMPANY

Manufacturers and Fabricators of Seamless and Electric Welded Steel Tubing

Plant and General Offices: SHELBY, OHIO

OSTUCO SHELBY, OHIO

SALES OFFICES: Birmingham, P. O. Box 2021 • Chicago, Civic Opera Bldg., 20 N. Wacker Dr. Cleveland, 1328 Citizens Bldg. • Dayton, 511 Salem Ave. • Detroit, 520 W. Eight Mile Road, Ferndale • Houston, 6833 Avenue W, Central Park • Los Angeles, Suite 300-170 So. Beverly Drive, Beverly Hills • Moline, 617 15th St. • New York, 70 East 45th St. • Philadelphia, 2004 Packard Bldg., 15th & Chestnut • Pittsburgh, 1206 Pinewood Drive • St. Louis, 1230 North Main St. • Seattle, 3104 Smith Tower • Syracuse, 2350 Bellevue Ave. • Tulsa, 245 Kennedy Bldg. • Wichita, 622 E. Third St. • *Canadian Representative:* Railway & Power Corp., Ltd.

Structural Shapes . . .

Structural Shape Prices, Page 162

Boston—Critical situation in wide flange beam tonnage confronts structural fabricating shops. Less volume from Pittsburgh area over next few months, is emphasized by heavy load on other producers. One will limit structural allotments to 20 per cent in wide flanged beams. Larger fabricating shops are more extended on girder work, but this holds with district fabricators to less degree.

New York—American Bridge Division, United States Steel Corp., is low on 43,207 tons for the Tappan Zee bridge over the Hudson river at Tarrytown, N. Y. with a bid of $28,807,093. This fabricator was awarded 9000 tons for a section of this project a few weeks ago.

Philadelphia—While there are fewer large projects and over-all structural demand is off, there are more small jobs, and the small fabricating shops are competing actively.

Pittsburgh — There have been no deferments in demand for structurals, but fabricators are not pushing quite as hard for tonnage. Mills' carryover will take them through first half of third quarter. Carbuilders' demands are expected to revive soon.

Seattle—Major fabricating plants are idle due to a labor dispute and as a result the industry is more-or-less marking time.

Wire . . .

Wire Prices, Page 164

Boston—Wire bookings for July are substantial for some products while incoming tonnage on others is slow. With minor exceptions June capacity is filled with some open-end volume included on which shipments depend on the movement of backlogs between now and July 1. Rated or military tonnage for third quarter is estimated around 10 per cent, tire chain and barbed wire making up the bulk of this demand, depending on mills.

Stainless and other alloys are quiet with pressure off for most fine wire specialties.

Rails, Cars . . .

Track Material Prices, Page 164

Birmingham — Louisville & Nashville and the Southern railway have placed orders with the Bessemer plant of Pullman Standard Car & Mfg. Co. for 500 specially designed 95-ton ore cars for use in bringing Venezuelan ore to Birmingham through the Port of Mobile. The orders involve 250 cars for each railroad and are valued at approximately $6 million.

This scene is from our short, factual color movie *"Keeping Costs Under Straps,"* showing power strapping in wire mill operations.

Profit has its picture taken

● *Power strapping* has proved a profit maker. It saves time, steps up production all along the line, and permits better use of available manpower.

If you are doing some hard-headed thinking about cutting operating costs, it will be well worth-while to learn how *Signode Power Strapping Machines* can help your plans for greater economy—more profits.

The scene above is rapidly becoming familiar in well-managed strip mills. Coils of wire are being packaged for safe, easy handling by *Signode Power Strapping Machines.*

Signode Power Strapping Machines are built and installed to specific production line requirements. To give our mill specialist time to draw plans that show you how these machines can be integrated in your set-up, invite him to meet with your production executives *now.* Set the date for your convenience. Write, J. M. Moon, V. P., Director of Sales, Signode Steel Strapping Co., 2645 N. Western Ave., Chicago 47, Illinois.

Be seeing you at 5th National Materials Handling Exposition May 18-22, 1953, Philadelphia Booths 1538, 1540

STEEL SIGNODE STRAPPING

Offices from coast to coast: In Canada: Canadian Steel Strapping Company, Ltd. Foreign Subsidiaries and Distributors world-wide.

ANOTHER TESTED AND APPROVED SIGNODE APPLICATION

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237; gross ton lots, packed $252; less gross ton lots, packed $269; f.o.b. Sher.dan, Pa., Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, Philo or Marietta, O., Lynchburg, Va. Base price: $227, Johnstown, Pa.; $228, Etna, Pa.; $226, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267; less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 0.5c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C. 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 30c; ton lots, 32c; 250 to 1999 lb, 34c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max. Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 37.60c per lb contained Cr, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25c per lb of contained Cr, C.l., packed 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained silicon plus 16.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract carload, 1" x D; packed, max 0.50% ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c; prices on 0.10 per cent carbon grade, C grade, $1.12 per lb of contained chromium, up 4c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 10,000 lb W or more, $4.35 per lb of contained W; 2000 lb W to 10,000 lb W, $4.45; less than 2000 lb W, $4.57, f.o.b. Niagara Falls, N. Y.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅜ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton lot 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr, 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

"God: Give me the strength to smile..."

Smile, and hold back your tears: SHE *must not see them.*

Keep secret the voice that is crying inside of you: SHE *must not hear it.*

Smile...that she may sense no echo of the voice YOU *heard this morning —the surgeon's voice, gentle and hopeless. "I'm sorry. I'm afraid we're too late."*

* * * * * * * *

"Too late..." Cancer, the most terrible scourge of all, last year killed 70,000 Americans who would have lived if treated in time. Few indeed are the Americans whose lives will never be shadowed by this monstrous and implacable enemy. It may be you. Your wife, your parents. Your children...

"Too late..." The bitter, pitiful truth is that we Americans—the most generous people on earth—have not yet contributed adequately to the war against cancer. And some are paying immeasurably in agony and grief, because there is not enough money.

Is there hope—? Hope of a final, certain cure for cancer—?

Yes, there is hope. Night and day our medical laboratories are forging the swords of knowledge. But not as fast as we all wish and pray they were—there is not enough money...

Far from enough! Last year, the American Cancer Society was able to allocate only $4,100,000 for cancer research—less than three cents per American per *year!* Yet, as things stand today, 22 million Americans will die of cancer—for cancer strikes one out of five. How long can we remain so indifferent to this monstrous thing—how many lives can we afford to throw away—?

Won't *you* please contribute—now, before you forget again? *Please* let your contribution be as large as your faith, and as heartfelt as your prayer...that, working together, we can lift this sorrow not only from our own time and nation, but from all the ages of man to come...

Strike Back! *Give to Conquer Cancer!*

AMERICAN CANCER SOCIETY

GENTLEMEN: Please send me free literature about cancer.

Enclosed is my contribution of $..... ..... to the cancer crusade.

NAME .....

ADDRESS .....

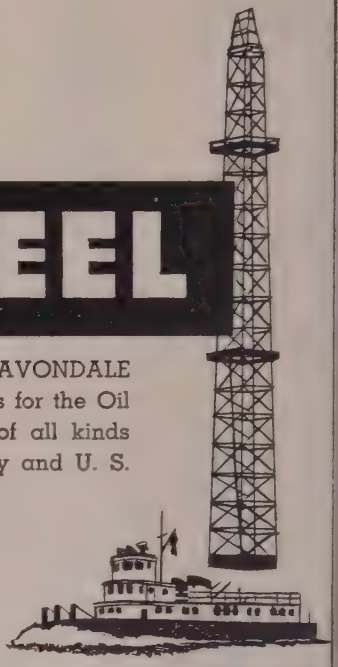
CITY..... STATE.....

Simply address the envelope: "CANCER" c/o POSTMASTER NAME OF YOUR TOWN

AVONDALE

Pouring steel castings at AVONDALE'S Foundry Division

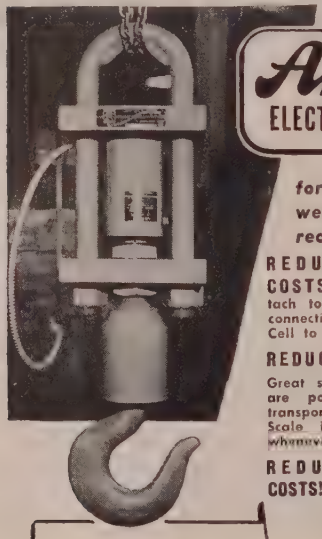
synonymous with **STEEL**



Steel is the tool, the medium which AVONDALE uses. Steel towboats, barges, drill rigs for the Oil industry; steel ships and equipment of all kinds for the marine industry; steel for Navy and U. S. Engineer jobs. AVONDALE builds and repairs and fabricates with steel; its foundry division pours steel day in and day out . . .

AVONDALE MARINE WAYS, Inc.

Main Plant: Avondale, La. **"Quick Repair Plant": Harvey, La.**
Foundry Division (Service Foundry): New Orleans, La.



Ametron
ELECTRONIC CRANE SCALE

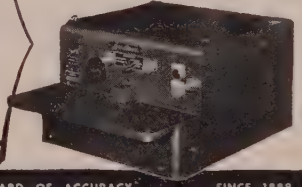
for heavy industrial weighing and remote recording

REDUCES INSTALLATION COSTS! Entire assembly ready to attach to crane or hoist. Only a cable connection is run from Baldwin Load Cell to remote recorder.

REDUCES OPERATING COSTS! Great savings in time and man power are possible because weighing and transporting operations are combined. Scale is easily removed from crane whenever desired.

REDUCES MAINTENANCE COSTS! The only element subjected to weight is the sturdy load cell, which can be easily replaced or interchanged.

See Ametron in Action at Booth 1843 Material Handling Show



Write for free Ametron Brochure C-2

THE STANDARD OF ACCURACY SINCE 1888
STREETER-AMET COMPANY
4101 N. RAVENSWOOD AVENUE • CHICAGO 13, ILLINOIS
Branches in Pittsburgh, Pa. and Birmingham, Ala.

THE BELMONT IRON WORKS

STRUCTURAL STEEL—BUILDINGS & BRIDGES

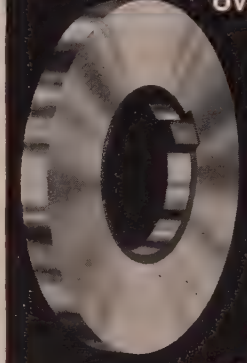
RIVETED—ARC WELDED *Cable Address—Beliron*

Engineers—Fabricators—Erectors—Contractors—Exporters
Shops—Philadelphia—Eddystone—Royersford
Main Office: Phila. 46, Pa.
New York Office—44 Whitehall St., N. Y. 4, N. Y.

COWLES

GANG SLITTING KNIVES

OVER 30 YEARS EXPERIENCE



Standard for *Service* and *Durability.* Ground to extremely close Tolerances and Finish. Made by *Toolmakers.*

COWLES TOOL COMPANY
2086 W. 110th ST. CLEVELAND 2, OHIO

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in Italic.

ORES

Lake Superior Iron Ore

(Prices effective for ore delivered up to and including June 30, 1953; gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.10
Old range nonbessemer	9.95
Mesabi bessemer	9.85
Mesabi nonbessemer	9.70
Open-hearth lump	10.95
High phosphorus	9.70

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect on Dec. 31, 1952, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	*17.00-18.00*

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	*24.00-26.00*
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	*$55.00*
Domestic scheelite, mine	*63.00*

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90c-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F*: Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa. $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent*: Clearfield, Pa., St., Louis, Mexico, Mo., $166.30; Danville, Ill., $169.30.
60 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.
70 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00
New River foundry	20.80
Wise county foundry	15.95
Wise county, furnace	15.20

Oven Foundry Coke

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
LoneStar, Tex. ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

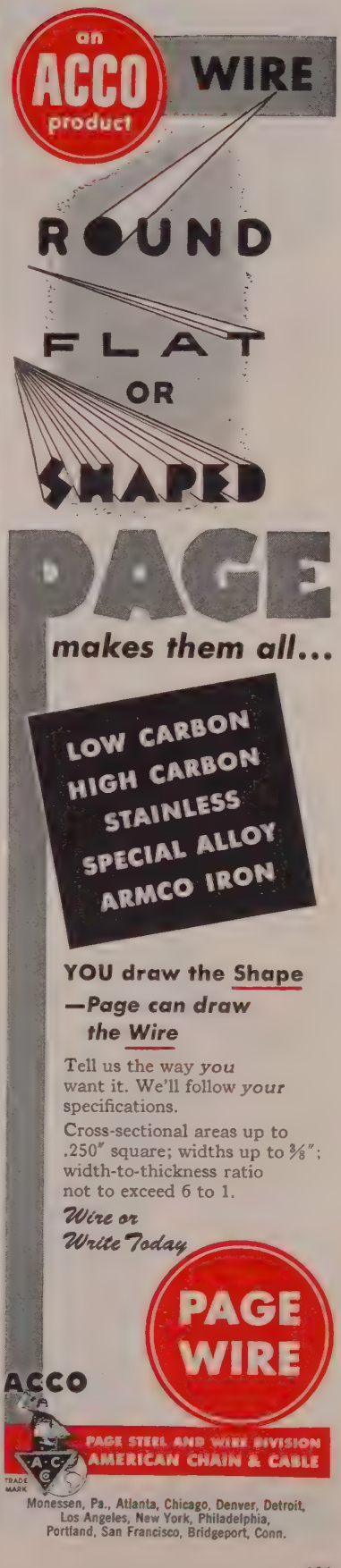
Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $35-$36.



How LINK-BELT Welded Steel Pulleys minimize shaft deflection

LINK-BELT Welded Steel Pulleys end one common cause of head and tail shaft failure by minimizing deflection. By making the hub flush with the pulley face, bending movement is directly decreased. In addition, Link-Belt design assures minimum disc deflection . . . reduces hub bolt stress. With water- and dust-tight construction—plus provision for interchangeable hubs—you get lower maintenance, top performance and longer pulley life. Ask your Link-Belt representative for full details.

LINK-BELT

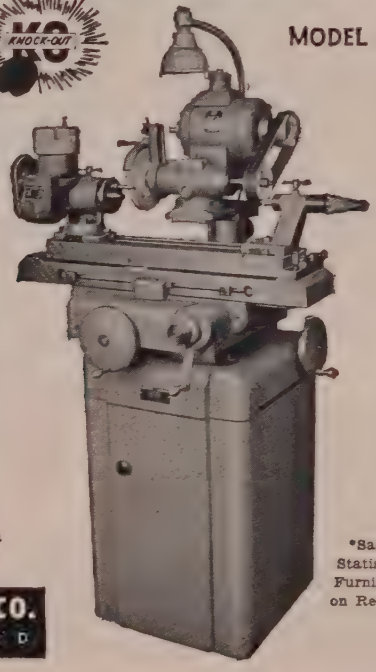
WELDED STEEL PULLEYS

Note how the bearing support and hub of the Link-Belt Welded Steel Pulley are mounted with minimum clearance.

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities. 13.215

There's a reason 76%* of all popularly-priced Tool and Cutter Grinders sold in 1952 were "Knock-Outs"

MODEL B860



Will do anything that machines costing 2 or 3 times more will do . . . yes and in less time.

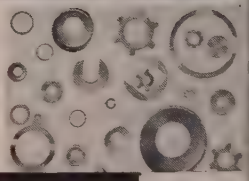
Distributed Only Through Franchise Dealers

K. O. LEE CO.
ABERDEEN, S. D.

*Sales Statistics Furnished on Request

"WHITEHEAD WILL HAVE DIES FOR THESE WASHERS"

Washers are "big business" with Whitehead. Production is fast, economical. Big runs from automatic presses. U. S. Air Corps Standard washers, U. S. and S.A.E. Standards, etc. WRITE FOR CATALOG.



WHITEHEAD STAMPING CO.

1667 W. Lafayette • Detroit 16, Mich.

Versatility counts in

HOT DIP GALVANIZING

any size or shape product, any size order from the smallest to the largest

Excellent facilities for pickling and oiling

ENTERPRISE
GALVANIZING COMPANY

2525 E. Cumberland Street Philadelphia 25, Pa.

MADE TO SUIT *Your* FABRICATING NEEDS

WELDED and COLD DRAWN

STAINLESS STEEL

• And other heat and corrosion resistant alloys—made with Quality Control through every step of manufacture.

CUSTOMERS SAY: "Best fabricating and machining qualities we ever had."

HELICAL TUBE CORPORATION
19 Washington Street, East Orange, N. J.
MILL: 1825 Monroe Ave., N.W.
Grand Rapids 5, Mich.

WARD STEEL CO.

We specialize in
FINISHED STEEL
BARS—TUBES—STRIP

PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of
BLUE TEMPERED SPRING STEEL

We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand.

87A Rindge Ave. Ext. Phone UN 4-2460
CAMBRIDGE 40, MASS.

Branches
3042-3058 W. 51st Street, CHICAGO, ILL.
Phone: Grove Hill 6-2600

Fenner Street, Providence, R. I.
Phone: Gasper 1-5573, 1-8573

Tubular Goods . . .

Tubular Goods Prices, Page 165

Pittsburgh — Third quarter books are open for tubular goods orders. From the looks of things they will be bulging. Seamless inquiries indicate good demand into fourth quarter, possibly beyond. Buttweld is enjoying a good market, but no one is optimistic enough to say how long this will continue. Some jobbers are selling pipe at reduced prices. Oil country goods will be strong for third quarter, and probably fourth.

Boston — As supply exceeds demand, weakness at secondary price levels shows up in buttweld pipe and light-walled electric welded tubing in smaller strip sizes. Distributors are taking approximately 50 per cent of the buttweld offered while in light tubing, surplus is offered consumers producing in excess of their own requirements from small mills. Stainless and other tubing specialties are steadier.

New York—Phoenix Iron & Steel Co., Phoenixville, Pa., has been granted a certificate of necessity by the Office of Defense Mobilization for seamless steel tubing facilities involving investment of $10.5 million. Fifty per cent has been certified for rapid write-off. Tube mill equipment, acquired some time ago from the Pittsburgh Steel Co., Pittsburgh, has been delivered to Phoenixville.

San Francisco—Buttweld pipe supplies are ample, but there is no evidence of price shading. Seamless tubing and oil country goods are not in adequate supply relative to the demand.

Iron Ore . . .

Iron Ore Prices, Page 181

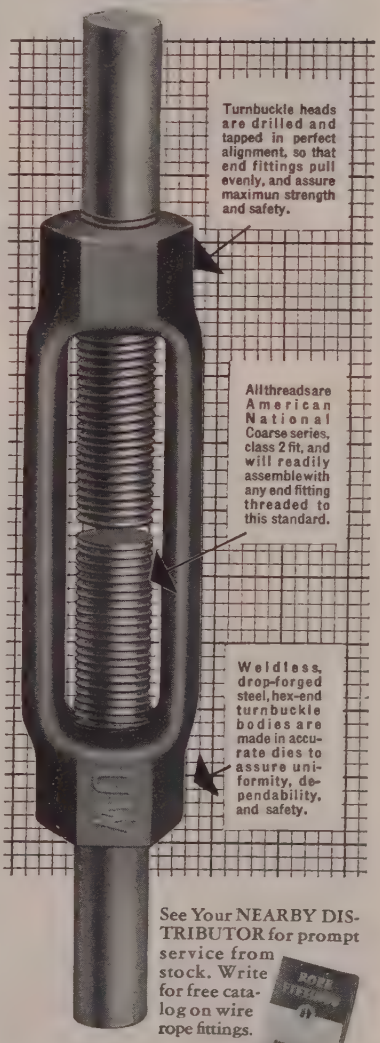
Cleveland—Movement of iron ore from upper lake ports is at a substantially faster pace than a year ago at this time. Shipments in the week ended Apr. 20 totaled 2,071,241 tons, bringing the 1953 season total to date to 4,695,629 gross tons, according to the Lake Superior Iron Ore Association. This compares with 1,757,671 tons in the like week last year, which brought the 1952 season movement to that date to 2,773,035 gross tons.

Ore consumption in March totaled 8,257,312 tons, comparing with 7,395,994 tons in February and with 8,031,919 tons in March, 1952. In the first three months this year consumption totaled 23,945,891 tons against 22,792,611 in the like period of 1952.

Total stocks of Lake Superior ore at blast furnaces and on Lake Erie docks on Apr. 1 were 22,064,976 gross tons. On Mar. 1 the total was 29,948,749 tons, and on Apr. 1, 1952, it was 21,451,105 tons.

UPSON-WALTON turnbuckles

ENGINEERED FOR SAFETY


Turnbuckle heads are drilled and tapped in perfect alignment, so that end fittings pull evenly, and assure maximun strength and safety.
All threads are American National Coarse series, class 2 fit, and will readily assemble with any end fitting threaded to this standard.
Weldless, drop-forged steel, hex-end turnbuckle bodies are made in accurate dies to assure uniformity, dependability, and safety.

See Your NEARBY DISTRIBUTOR for prompt service from stock. Write for free catalog on wire rope fittings.

THE UPSON-WALTON CO.
12500 ELMWOOD AVENUE
CLEVELAND 11, OHIO
New York • Chicago • Pittsburgh

YOU CAN DEPEND ON UPSON-WALTON'S LONG EXPERIENCE—ESTABLISHED 1871

Manufacturers of ALL THREE
FITTINGS • WIRE ROPE • TACKLE BLOCKS

MORE PROFITABLE
Scrap Handling

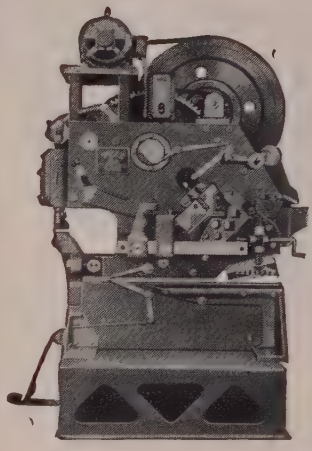
assured by
OWEN Grapples

THE OWEN BUCKET CO., 6012 Breakwater Ave., Cleveland, O.
Branches: New York, Philadelphia Chicago, Berkeley, Calif.

WEBB
STEELWORKER

The Newest Combination Punch & Shear
Designed For Diversified or Production Work

5 Complete Tools in ONE
2 WEEKS' DELIVERY



1 Punch for plate, bars or structurals.
2 Cuts angles and tees with straight or miter cut.
3 Cuts off round and square bars.
4 Shears plates and bars.
5 Coping or notching attachment.

For diversified shop work or high production output, this all-purpose machine is always in complete readiness to do any of above operations.

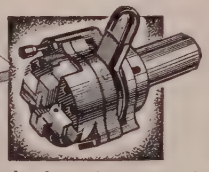
Write for Illustrated Literature and Prices Today.

Mfrs. of PLATE BENDING ROLLS and INDUSTRIAL WEIGHING EQUIPMENT

THE WEBB CORP.
WEBB CITY, MO., U. S. A.

Since 1881

H&G Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

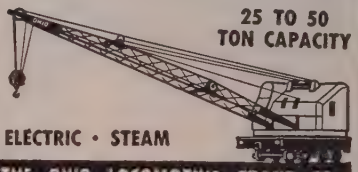
THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*

The *Cleveland Steel Tool Co.*
• PUNCHES • DIES • CHISELS • RIVET SETS •
IF IT'S *RIVETED* YOU KNOW IT'S SAFE
WE FEATURE SPECIAL PUNCHES & DIES
660 E. 82nd ST., CLEVELAND, O.

SPRINGS
STAMPINGS
WIRE FORMS

M. D. Hubbard Spring Company
604 CENTRAL AVE. PONTIAC, MICH.

OHIO LOCOMOTIVE CRANES



25 TO 50 TON CAPACITY

DIESEL • GASOLINE • ELECTRIC • STEAM

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

mechanical
POWER PRESSES
FOR
ALL INDUSTRIES
ZEH & HAHNEMANN CO.
56 AVENUE A, NEWARK 5, N. J.

INTRODUCTION TO THE STUDY OF
HEAT TREATMENT OF METALLURGICAL PRODUCTS
By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages — 4 tables
69 Illustrations — Price $5.00 Postpaid

THE PENTON PUBLISHING CO.
Book Department, 1213 W. 3rd St., Cleveland 13, O.

Scrap . . .

Scrap Prices, Page 186

Pittsburgh — Scrap isn't moving. Slowest business since the steel strike is reported as mills are dipping into inventories. The few small purchases in this district have moved at prices quoted in STEEL.

Closing of the No. 3 open hearth at Homestead is being felt. This shop ordinarily consumed about 40,000 tons of scrap monthly.

Pittsburgh mills can buy scrap out of Milwaukee at the market price for the district. In the absence of representative buying and reflecting current market views on prices various grades are quoted nominally lower, with cast iron borings $33 to $34; cut structurals $48.50 to $49.50; heavy turnings $43; punchings and plate scrap $48.50 to $49.50; electric furnace bundles $44; No. 1 cupola cast $45 to $46; charging box cast $43 to $44.

Unstripped motor blocks and No. 1 machinery cast should both be more attractive to purchasers at a dollar reduction, says one dealer. Random lengths of rails should be dropped $1 and railroad specialties to $54 to $55.

It should be remembered, these are suggested prices at which it is felt scrap will move. If mills want it, they can have it at these prices, but as of this writing, there are few takers.

Cleveland—Further signs of weakness have developed in the scrap market with mill and foundry buying extremely sluggish. Scrap men describe the market as dead. For the most part quoted prices are nominally unchanged, but the feeling in the trade is that lower quotations will prevail when representative buying is resumed. The No. 2 grades of steel scrap appear unusually weak with No. 2 heavy melting quoted $40 to $40.50 and No. 2 bundles $37.50 to $38.

With the mills pushing operations at capacity pace the hope persists among scrap men that active buying will be resumed soon. However, mill stocks continue substantial. Shipments from dealers against April commitments are reported just about completed so that scrap is beginning to accumulate at faster pace in dealers' yards.

Boston—Scrap prices are easier on the small volume of new buying, both steelmaking and cast grades. Demand for the latter is near standstill and yards are slowing down intake of cast. Secondary grades of steel scrap are showing most weakness, turnings especially. Steel scrap inventories are substantial with consumers.

New York—Scrap brokers have reduced buying prices on several items. They are now offering $30.50 to $31.50 for No. 2 heavy melting, $29 to $30 for No. 2 bundles, $20.50 to $21 for machine shop turnings, $23.50 to $24 for mixed borings and turnings and short shovel turnings, $37 for No. 1 cupola cast, and $26 to $27 for unstripped motor blocks.

Despite a drop in demand yard scrap is not increasing, as collections have fallen off. One answer is found in the particularly slack demand for No. 2 bundles.

Buffalo—Approximately 14,000 tons of scrap arrived here by water last week. The tonnage added to bearish sentiment in the market. Prices on borings and turnings declined $1.50 per ton.

Philadelphia—Trend in scrap continues easier. Most consumers of steel grades have fairly comfortable inventories on hand and are not pressing for tonnage, even in the very top grades. Greatest weakness appears in No. 2 bundles on which prices are purely nominal at around $36 to $37 delivered. Machine shop turnings are easier at $30, delivered, and heavy turnings at $40.50 to $41.50. Cast grades are fairly steady, with heavy breakable actually a little stronger at $44 to $44.50, delivered.

Detroit—Turnings continue to edge toward the $20 level, predicted a week ago to be reached about May 1. No. 2 grades of scrap are not moving in the area at the moment with orders filled.

Cincinnati—The scrap market is showing general weakness. No. 1 and No. 2 grades of heavy melting and bundles have taken a downward turn. Lower prices also are quoted for No. 1 busheling, turnings, structurals and plate. These quotations are in reality merely talking prices as there is little buying being done now. Shipments are being made now on the old prices.

Chicago—Further sagging in open-hearth scrap prices numbed the market here last week and further weakening seems inevitable. A major consumer is expected to buy momentarily, an eventuality which likely will exert considerable influence on the price pattern. Last week's activity saw No. 1 heavy melting scrap slip off $1.50 a ton and No. 1 bundles lost 50 cents. This was the first time the No. 1 grades have fallen below OPS ceilings since price control was dropped in mid-February.

St. Louis — Scrap prices softened sharply last week as mills with in-

(*Turn to page* 188)

IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Apr. 23	$42.67
Apr. 16	43.42
Mar. avg.	44.13
Apr., 1952	43.00
Apr., 1948	40.41

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania. *Revised.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	44.00*
No. 2 heavy melting	39.00-40.00*
No. 1 bundles	44.00*
No. 2 bundles	35.00-36.00*
No. 1 busheling	44.00*
Machine shop turnings	29.00-30.00*
Mixed borings, turnings	29.00-30.00*
Short shovel turnings	34.00-35.00*
Cast iron borings	34.00-35.00*
Cut structurals	49.00-50.00*
Heavy turnings	44.00*
Punchings & plate scrap	49.00-50.00*
Electric furnace bundles	46.00*

Cast Iron Grades

No. 1 cupola	46.00-47.00
Charging box cast	44.00-45.00
Heavy breakable cast	42.00-43.00
Unstripped motor blocks	40.00-41.00
No. 1 machinery cast	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
Rails, 2-ft. and under	55.00-56.00
Rails, 18-in. and under	57.00-58.00
Rails, random lengths	53.00-54.00
Railroad specialties	54.50-55.50

*Plus applicable freight springboards from other areas.

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	41.50-42.50*
No. 2 heavy melting	*40.00-40.50**
No. 1 bundles	41.50-42.50*
No. 2 bundles	37.50-38.00*
No. 1 busheling	41.50-42.00*
Machine shop turnings	29.00-30.00*
Mixed borings, turnings	32.00-33.00*
Short shovel turnings	32.00-33.00*
Cast iron borings	32.00-33.00*
Low phos., electric furn.	48.00-49.00*
Low phos., foundry	51.00-52.00*
Alloy free, short shovel turnings	36.00-37.00*
Electric furnace bundles	45.00-46.00*

Cast Iron Grades

No. 1 cupola	46.00-47.00
Charging box cast	45.00-46.00
Stove plate	45.00-46.00
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	40.00-41.00
Clean auto cast	51.00-52.00
No. 1 wheels	46.00-47.00
Burnt cast	40.00-41.00
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00
R. R. Malleable	50.00-51.00
Rails, 3-ft. and under	58.00-60.00
Rails, 18-in. and under	61.00-62.00
Rails, random lengths	56.00
Cast steel	51.00-52.00
Railroad specialties	53.00-54.00
Uncut tires	52.00-53.00
Angles, splice bars	54.00-55.00
Rails, rerolling	56.00

*Plus applicable freight springboards from other areas. Prices on steel grades are nominal.

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	41.50-42.50*
No. 2 heavy melting	*40.00-40.50**
No. 1 bundles	41.50-42.50*
No. 2 bundles	*37.50-38.00**
Machine shop turnings	29.00-30.00*
Short shovel turnings	32.00-33.00*
Cast iron borings	32.00-33.00*
Low phos.	48.00-49.00*
Electric furnace bundles	45.00-46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00

*Plus applicable freight springboards from other districts. Prices on steel grades are nominal.

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	44.00-45.00
No. 2 bundles	*36.00-37.00*
No. 1 busheling	43.00-44.00
Machine shop turnings	*30.00*
Mixed borings, turnings	34.00-35.00
Short shovel turnings	35.00-36.00
Structurals & Plate	46.50-47.50
Heavy turnings	*40.50-41.50*
Couplers, springs, wheels	52.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	43.00
Heavy breakable cast	*44.00-44.50*
Unstripped motor blocks	32.00-33.00
Drop broken machinery	48.00-50.00

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting	37.00
No. 2 heavy melting	*30.50-31.50*
No. 2 bundles	*29.00-30.00*
Machine shop turnings	*20.50-21.00*
Mixed borings, short turnings	*23.50-24.00*
Low phos. (structural & plate)	40.50
Shovel turnings	*23.50-24.00*

Cast Iron Grades

No. 1 cupola	*37.00*
Unstripped motor blocks	*26.00-27.00*

BOSTON

(Brokers' Buying Prices; f.o.b. shipping points)

No. 1 heavy melting	*33.17-34.17*
No. 2 heavy melting	*31.17*
No. 1 bundles	*33.17-34.17*
No. 2 bundles	*29.17*
Machine shop turnings	*20.17*
Mixed borings, turnings	*20.17*
Short shovel turnings	*24.17*
No. 1 cast	34.00-35.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	46.00-47.00

DETROIT

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	*34.50-35.00*
No. 1 bundles	40.00-41.00
No. 2 bundles	30.00-31.00
No. 1 busheling	40.00-41.00
Machine shop turnings	21.50-22.00
Mixed borings, turnings	*22.00-22.50*
Short shovel turnings	*22.00-22.50*
Punchings & plate scrap	42.00-43.00

Cast Iron Grades

No. 1 cupola	47.50
Charging box cast	40.00-42.00
Stove plate	43.00-44.00
Unstripped motor blocks	30.00
Clean auto cast	50.00
Malleable	48.00

CINCINNATI

(Delivered consumer plant)

No. 1 heavy melting	*43.00*
No. 2 heavy melting	*39.00*
No. 1 bundles	*43.00*
No. 2 bundles	*37.00*
No. 1 busheling	*43.00*
Machine shop turnings	*29.00*
Mixed borings, turnings	*30.00**
Short shovel turnings	31.00*
Cast iron borings	31.00*
Structural & plate, 3 ft.	*44.00*

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	40.00
Stove plate	36.00*
Burnt cast	36.00*
Heavy breakable cast	38.00
Unstripped motor blocks	34.00
Brake shoes	37.00*
Clean auto cast	43.00
Drop broken machinery	49.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
Malleable	*46.00*
Rails, 18-in. and under	58.00-59.00
Rails, random lengths	49.00
Rails, rerolling	52.00

*F.o.b. shipping point.

CHICAGO

No. 1 heavy melting	*40.00-41.00**
No. 2 heavy melting	*38.00-39.00**
No. 1 bundles	*43.00-44.00**
No. 2 bundles	*35.00-36.00**
No. 1 busheling	*40.00-41.00**
Machine shop turnings	23.00-24.00*
Mixed borings, turnings	23.00-24.00*
Short shovel turnings	*24.00-26.00**
Cast iron borings	23.00-24.00*
Cut structurals	46.00-47.00*
Electric furnace bundles	45.00-46.00*

Cast Iron Grades

No. 1 cupola	42.00-43.00
Stove plate	38.00-40.00
Unstripped motor blocks	38.00-40.00
Clean auto cast	*46.00-48.00*
Drop broken machinery	*45.00-47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-47.00
R.R. Malleable	45.00-47.00
Rails, 2-ft. and under	55.00-57.00
Rails, 18-in. and under	57.00-59.00
Angles, splice bars	52.00-54.00
Rails, rerolling	*50.00-53.00*

*Plus applicable freight springboards from other areas.

BIRMINGHAM

No. 1 heavy melting	37.00-38.00
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	37.00-38.00
No. 2 bundles	*31.00-32.00*
No. 2 busheling	35.00-36.00
Machine shop turnings	26.00-27.00
Mixed borings, turnings	31.00-32.00
Short shovel turnings	*28.00-29.00*
Cast iron borings	*28.00-29.00*
Cut structurals	41.00-42.50
Heavy turnings	38.00
Punchings & plate scrap	41.00-41.50
Electric furnace bundles	*37.00-38.00*

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	*40.00-41.00*
Charging box cast	*39.00-39.00*
Stove plate	*36.50-37.50*
Heavy breakable cast	*39.00-31.00*
Unstripped motor blocks	34.00-35.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	46.00-47.00
Burnt cast	41.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Malleable	nom.
Rails, 2-ft. and under	46.00-47.00
Rails, 18-in. and under	46.00-47.00
Rails, random lengths	42.00-43.00
Cast steel	44.00
Uncut tires	43.00
Angles, splice bars	46.00-47.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' Buying Prices)

No. 1 heavy melting	*37.00*
No. 2 heavy melting	*37.00*
No. 1 bundles	40.00
No. 2 bundles	37.00
Machine shop turnings	*25.00-26.00*
Short shovel turnings	*27.00-28.00*

Cast Iron Grades

No. 1 cupola	*43.00-44.00*
Charging box cast	*37.00-38.00*
Heavy breakable cast	*32.00-34.00*
Unstripped motor blocks	33.00-35.00
Brake shoes	41.00
Clean auto cast	44.00
Burnt cast	37.00-39.00

Railroad Scrap

Malleable	*38.00-40.00*
Rails, 18-inch and under	*55.00-56.00*
Rails, random lengths	*39.00-40.00*
Uncut tires	46.00
Angles, splice bars	*48.00-49.00*
Rails, rerolling	*48.00-50.00*

BUFFALO

No. 1 heavy melting	$45.00-46.00
No. 2 heavy melting	41.50-42.00
No. 2 bundles	39.50-40.00
No. 1 bundles	43.00-44.00
No. 1 busheling	43.00-44.00
Machine shop turnings	*28.00-29.00*
Mixed borings, turnings	*34.50-35.00*
Short shovel turnings	*35.50-36.00*
Low phos.	48.50-49.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	42.50-43.00
Drop broken machinery	45.50-46.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	32.00
No. 2 bundles	26.00
No. 3 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Short shovel turnings	15.00
Electric furnace, No. 1	40.00-41.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	40.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	29.00
No. 1 wheels	38.00-40.00

Railroad Scrap

Rails, random lengths	38.00

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
No. 1 busheling	30.00
Machine shop turnings	12.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	*40.00*
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Malleable	55.00
Rails, 3-ft. and under	42.00
Rails, 18-in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	*24.00*
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	12.00

Cast Iron Grades (F.o.b Shipping Point)

No. 1 cupola	38.00-41.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	31.50
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	28.50
Rails, Remelting	35.50
Rails, Rerolling	38.50
Busheling	28.00
Busheling new factory: Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	23.50

Cast Iron Grades

No. 1 Machinery Cast	50.00

† F.o.b., shipping point.

THE ROLE OF SCRAP IN THE FLOW OF OIL

"SUCKER RODS"

keep nation's 400,000 wells pumping daily

More than 400,000 oil wells are being pumped in the United States today from depths averaging 3600 feet. To pump this oil to the surface, oil men depend on "sucker rods" to accentuate the plunger action of an oil field pump. It is made of 55% special steel scrap and 45% pig iron.

These special steels require special scrap of known analysis — a problem particularly suited to our experience, personnel, equipment and the strategic location of our field offices.

Possibly our facilities may help you solve a special problem in iron or steel scrap.

Sucker rods range from ⅝ inch to 1 inch in diameter. They are 30 feet long and linked end to end by a threaded connection. MATERIALS: AISI, A3310 (3.5% nickel, 1.5% chromium)

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

PLANTS

LEBANON, PENNA. DETROIT (ECORSE), MICHIGAN
READING, PENNA. PITTSBURGH, PENNA.
MODENA, PENNA. ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA.	DETROIT, MICH.	PITTSBURGH, PENNA.
BOSTON, MASS.	HOUSTON, TEXAS	PUEBLO, COLORADO
BUFFALO, N. Y.	LEBANON, PENNA.	READING, PENNA.
CHICAGO, ILLINOIS	LOS ANGELES, CAL.	ST. LOUIS, MO.
CLEVELAND, OHIO	NEW YORK, N. Y.	SAN FRANCISCO, CAL.
	SEATTLE, WASH.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap . . .

(*Continued from page* 185)

ventories ranging up to 90 days, remained completely out of the market. Their outstanding high priced orders have been filled, cancelled or embargoed. Meanwhile rising dealer stocks have put further pressure on prices.

Brokers marked down quotations $1 to $4 on melting steel. Random length rails dropped from $50 to $40.

Birmingham—Scrap remains in uncertain position in the Birmingham area with relatively few grades moving. Prices on some grades would be lower were there any market or at least sufficient market to set a price pattern. This includes No. 1 heavy melting and No. 1 bundles.

Los Angeles—With mills out of the market on most grades, movement of scrap is slowing to a trickle. No. 2 heavy melting has sagged $2 to $24. Faced with limited domestic consumption and rising inventories, local dealers are eyeing Japan, whose steel mills are reported eager for scrap.

San Francisco—No. 1 cupola cast continued to advance last week, moving up $1 a ton to $40 a ton delivered. The relative cheapness of scrap as against pig iron is said to account for the demand. Foundries hold economics dictate use of scrap as long as it is obtainable at $10 a ton below the price of pig iron and the spread still is considerably more than that. Steel scrap prices remain steady.

Seattle—Scrap is coming to tidewater mills from adjacent area in satisfactory volume. Comfortable inventories have been accumulated. Prices are steady. Bethlehem Pacific Coast Steel Corp. announced resumption of No. 3 bundles as a separate item, quoted at $22, or $4 under No. 2 bundles. The segregation involves black and galvanized tonnage. During the war both No. 2 and No. 3 were listed as No. 2.

Pig Iron . . .

Pig Iron Prices, Page 158

Cleveland—Although foundry operations have shown some improvement over earlier in the year, largely reflecting pickup in demand for automotive and appliance castings, pressure for merchant pig iron is off. Consumers are taking in tonnage regularly but they are not ordering heavily for inventory.

Despite the comparatively dull demand merchant iron sellers are disposing of all their tonnage, though some are pushing sales more aggressively than was the case some months ago. Blast furnace operations in this immediate district continue at capacity.

Armco Steel Corp. recently officially placed in service its new $40 million blast furnace and coke plant at Middletown, O.

Boston—Smaller shipments of pig iron are primarily due to under-capacity melt by most larger consumers, among them textile mill equipment shops. Machine tool foundries have also passed peak melt in some cases. Large subcontract for milling machines is practically completed by a Beverly, Mass., shop. Jobbing foundry bookings are spotty while defense requirements are below average. This adds up to some stockpiling at Everett furnace, although foundry inventories are not large for normal melt.

New York—With gray iron foundry operations still lagging and consumer inventories fairly adequate, little demand pressure exists for pig iron. The Argentine government closed bids a few days ago on 40,000 tons of basic and malleable iron. It was understood that one western producer submitted bids on a portion of this tonnage.

Buffalo—Pig iron production continues at capacity level with merchant sellers reporting no difficulty finding outlets for their output. Automotive and building industries are providing an active demand.

Philadelphia—A slight improvement is noted in foundry pig iron consumption, reflecting better operations at most jobbing shops. However, pig iron supply is ample, excepting basic grade, and even in this latter tonnage is a little freer. Some Australian iron is expected to arrive in this district shortly against a sizable contract placed several weeks ago.

Cincinnati—The pig iron market seems to be pretty well stabilized at the moment. Business is steady. There have been no discernible changes in

CIMCO MACHINE TOOLS AT BARGAIN PRICES

Niles 36-44 Vertical Boring Mill.
King 42" Vertical Boring Mill, 2 heads.
Niles 42"-50" Driving Box Borer, Burnisher and Facer, late type.
Cincinnati #3 Hi-Power, Vertical Miller.
Hall Planetary Style D Miller.
Gould & Eberhardt 96 H Hobber.
Heald #50 Internal Grinder.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Landis 16 x 72 Plain Cylindrical Grinder.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Heald #70A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Heald 42 Boromatic.
Jones & Lamson 8 x 31 Thread Grinder.
Heald 72-A3 Plain Internal Grinder.
Lodge & Shipley 16" x 6' single pulley drive, 12 spindle speeds.
American 16" x 8', 3 SCD, 56" center distance, 1¼" hole in spindle.
Blount Model B-3 Special Application Lathe for Turning, 20" swing, 2½" hole in spindle, 54" centers.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
Fellows 725 Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Brown & Sharpe 3-26 Gear Cutter.
Oliver Template Tool Bit Grinder.
Lodge & Shipley 16" x 126" centers G.H. Lathe, Timken bearing, complete with taper attachment, late type.
Niles 48" x 48" x 16' Double Housing Planer, 4 heads, box table, DC reversible drive.
Landis 26" x 168" Plain Cylindrical Grinder.
American 30" x 14' G.H. Lathe, 12 speed.
Monarch 24" x 12' G.H. Lathe, complete with 22" 4 jaw chuck and taper attachment.
Bliss #58 Drawing Press, 5" stroke.
Cincinnati #2 Centerless Grinder.
American 4'11" column Triple Purpose radial drill, motor driven thru Turner gear box on arm.
Hanchett No. 600-36" UK Traveling Wheel Face Grinder, new 1946, table 72" x 86" long, 100 HP grinding wheel motor.
Baker #217 Upright Drill Press.
Gisholt 1L Saddle Type Turret Lathe, with bar feed, late type.
Milwaukee 2HL Plain Miller, late type.
LeBlond #2 Tool&Cutter Grinder, late.
Brown & Sharpe 3A Univ. Miller.
Van Norman #12 Universal Ram Type Mill, late type, 9 spindle speeds.
Sundstrand #2 Automatic Electromil, late type.

VISIT US AT OUR NEW LOCATION
CINCINNATI MACHINERY COMPANY, INC.
"GUARANTEED MACHINERY"
3905 KELLOGG AVE.
CINCINNATI 26, OHIO

RAILS NEW and RELAYING
Your exact trackage needs filled "Faster From Foster" Track Tools & Accessories are properly matched and fabricated to meet all requirements and shipped from a reliable source.
"FASTER from FOSTER"
RENT STEEL SHEET PILING
All Lengths, Sections, all standard makes your job requires. Also Rent Pile Hammers, Pile Extractors.
TRACK ACCESSORIES • PIPE • WIRE ROPE
L. B. FOSTER CO.
Pittsburgh 30, Pa. New York 7, N.Y.
Chicago 4, Ill. Houston 2, Tex.

FOR SALE
3—8" x 12" United 2-High Cold Mills with Combination Pinion Stands and Gear Sets; D. C. Motor Drives; Coilers.
FRANK B. FOSTER, INC.
2220 Oliver Building Pittsburgh 22, Pa.
Cable Address "Foster Pittsburgh"

World's Largest Inventory
NEW and REBUILT
MOTORS
GENERATORS
TRANSFORMERS
1 to 1500 H. P.
ELECTRIC EQUIPMENT CO.
ROCHESTER 1, NEW YORK

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Steel Sheathed, 40-Ton Capacity
Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton Capacity
Flat, 50-Ton, Steel Underframe, 40'6" Long
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Ore Hoppers, All-Steel, 50-Ton, Heavy Duty
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All-Steel, 70-ton, Triple Hopper Cross Dump

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door
End Dump, 20-Yd., 50-Ton, Drop Door
Side Dump, 30-YD., 50-TON, DROP DOOR

CABOOSE CARS

Eight Wheel, Cupola Type

OTHER EQUIPMENT

Jordan Spreader
Locomotive Cranes
Overhead Cranes
Railroad Track Scales

STANDARD GAUGE DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

300 H.P., 70-Ton, Type 0-4-4-0
NEW AND RELAYING RAIL

Send us your inquiries

REPAIR PARTS For All Types of Freight Cars

WE BUY FREIGHT CARS FOR DISMANTLING

IRON & STEEL PRODUCTS, INC.

Send us your offerings

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

General Office
13462 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAyport 1-3456

New York Office
50-D. Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

CLASSIFIED ADVERTISING

Positions Wanted

EXECUTIVE EXPERIENCED AS PLANT MANAGER with cost and production experience. Sound industrial background in administrative and management functions. 25 years' experience. B.S. Degrees M.I.T. Write Box 693, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOREMAN—WOOD PATTERNMAKING OR PURCHASING PATTERNS AND CASTINGS Twenty-two years as foreman and department manager in wood patternmaking in the medium to heavy iron and steel industry (foundry background and foundry connections) including also ten years purchasing patterns and castings, expediting and coordinating. Experience on patterns for the machine tool industry, power presses, rolling mill equipment, etc. Best of references from wherever pattern equipment was used. Write Box 707, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT MANAGER
Qualified by successful record in all phases of plant operation: engineering, production, tooling, methods, incentive, cost, controls, personnel. Steel fabrication, machining, machinery construction, pressure vessels. Write Box 720, STEEL, Penton Bldg., Cleveland 13, Ohio.

Employment Service

SALARIED POSITIONS $3,500 TO $35,000. WE offer the original personal employment service (established 43 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 110 Dun Bldg., Buffalo 2, N. Y

Help Wanted

PRODUCTION MANAGER
Steel fabricator of structural, reinforcing and miscellaneous iron for the construction industry. At present processing 3000 tons per month. Need energetic man with rich experience background. Splendid opportunity for future development. Position now open due to retirement and unexpected serious illness. Age range 35 to 45 years. Location southwest. Write Box 711, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALES ENGINEER
For Chicago and Pittsburgh Area. Excellent opportunity for experienced sales engineer who has been calling on steel and wire mills, engineering companies and chemical plants. Knowledge of pickling operations and corrosion necessary. Desired by 25 year old Midwest manufacturer of corrosion-proof equipment. Give complete resume and requirements. All replies will be treated strictly confidential. Reply Box 721, STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

PROCESS CONTROL METALLURGIST with some experience in Open Hearths and Plate Mills for eastern steel plant. Write Box 703, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALES EXECUTIVE
Manufacturer of steel joists, deck and culvert pipe; steel fabricator of structural, reinforcing and miscellaneous iron; warehousing of related steel specialties. Operation 9 southwestern states; present volume 3000 tons monthly. Position requires promotion of products to architects and engineers, and selling to contractors and owners. Prefer man 35 to 45 years. Excellent opportunity for experienced producer. Write Box 710, STEEL, Penton Bldg., Cleveland 13, Ohio.

IF YOU HAVE AN OPPORTUNITY TO OFFER

Use the "Help Wanted" columns of STEEL. Your advertisement in STEEL will put you in touch with qualified, high-calibre men who have had wide training in the various branches of the Metal Producing and Metalworking industries.

WANTED

Cast Steel Anvil For 3500# and 6000# Double Frame Chambersburg Steam Hammer.

Write Box 719, STEEL
Penton Bldg. Cleveland 13, Ohio

Opportunity

Structural and Plate Fabricator located in Southeast desires additional products. Will purchase outright or manufacture and sell same on royalty basis. Very well rated. Twenty-five men in Engineering Department, 125 men in Shop.

Write Box 717, STEEL
Penton Bldg., Cleveland 13, Ohio.

Wanted
SALESMAN—STAINLESS TUBING
To organize effective Sales Program on National basis. State experience, education and salary expected.
Address: Box 716, STEEL
Penton Bldg., Cleveland 13, Ohio.

SOAKING PIT — BLOOMING MILL FOREMAN
Experienced man to take charge of soaking pits and blooming mill for steel plant in Ohio Valley. Soaking pit experience paramount. Give age, experience, and compensation expectancy.
Write Box 706, STEEL
Penton Bldg. Cleveland, Ohio

SALES MANAGER

STEEL MILL EQUIPMENT

Leading manufacturer of steel mill equipment has challenging opportunity for experienced Sales Manager to direct all sales for fast growing company with $10,000,000 volume. Must have wide acquaintanceship in the iron and steel industry.

We prefer a successful Sales Manager or Regional Sales Manager currently selling such products as ferro-alloys, electric furnaces or controls, charging or manipulating equipment, coke, refractories, pig iron, molds, etc.

This is an excellent opening for a well qualified, ambitious sales executive 40 to 50 years of age, who would be interested in a starting salary of $20,000 to $25,000 plus bonus.

Replies may be brief, should include age, title, home telephone number and will be treated in strict confidence. Write Box 718, STEEL, Penton Bldg., Cleveland 13, Ohio.

THE MATHEWS ENGINEER BRINGS YOU 47 YEARS OF EXPERIENCE IN MECHANIZED HANDLING

Modern conveyer system work is a highly-specialized field . . . one in which there is no substitute for experience.

When you consult the Mathews engineer you get the benefit of experience, plus engineering resources and production facilities of three modern plants.

To get a greater return on your conveyer investment, better design, more efficient performance, longer service, call your nearest Mathews representative. Write for complete information.

MATHEWS CONVEYER COMPANY

GENERAL OFFICES
Mathews Conveyer Company . Ellwood City, Penna.
PACIFIC COAST DIVISION
Mathews Conveyer Company West Coast San Carlos, California
CANADIAN DIVISION
Mathews Conveyer Company, Ltd., Port Hope, Ont.

the market here the past several weeks. Silvery iron continues scarce because of the Jackson, O., furnace shutdown.

Los Angeles—Kaiser Steel Corp.'s Fontana Works third blast furnace, to increase pig iron output by 50 per cent, is completed and ready to be blown in, awaiting only completion of coke ovens.

San Francisco — Pig iron demand has slowed up considerably. As a result, Columbia-Geneva Steel Division, United States Steel Corp., has taken No. 2 blast furnace out of production at its Ironton, Utah, works.

Canada . . .

Toronto, Ont.—While iron and steel production in Canada in February fell below that of the preceding month the decline was entirely due to the shorter month. Daily output set a new high record. In the month production totaled 326,063 net tons, daily average of 91.9 per cent of capacity and comparing with 346,648 tons or 88.2 per cent for January and with 305,865 tons or 97.8 per cent in February, 1952.

Pig iron production in February amounted to 225,182 net tons for a daily rate of 86.9 per cent, against 244,606 tons or 85.2 per cent in January and 199,162 tons or 85.8 per cent in February, 1952.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

395 tons, West Side and Oak Street schools, Taunton, Mass., to A. O. Wilson Structural Co., Cambridge, Mass., through Gilbane Building Corp., Providence, R. I., general contractor. Reinforcing bars for two buildings to United States Steel Supply Division, United States Steel Corp., Boston.

300 tons, foundry and machine shop, Red Lion plant, Budd Co., Philadelphia, to Robinson Steel Co., Philadelphia, previously noted as low bidder.

250 tons, scrap dock and reclamation plant, Pennsylvania railroad, Hollidaysburg, Pa., to Griffith-Custer Co., Johnstown, Pa.

200 tons, storage cellar, Brewery, C. E. Schmidt & Son, Philadelphia, to Morris-Wheeler & Co., Philadelphia.

130 tons, substation steel, to Screw Machine Products Co., Portland, Oreg., by Bonneville Power Administration, low $37,734.

125 tons, penstocks, stoplogs, beams, Lookout Point dam, to Weldcraft Steel Co., Bellingham, Wash., low $43,171.

100 tons, trash track equipment, McNary dam, to Industrial Supply Co., Seattle, low $31,850 to U. S. Engineer, Walla Walla, Wash.

STRUCTURAL STEEL PENDING

43,207 tons, Tappan Zee bridge, over the Hudson river, between South Nyack and Tarrytown, N. Y., for State Thruway Authority, American Bridge Division, United States Steel Corp., Pittsburgh, low with a bid of $28,807,093; this interest a few weeks ago was awarded 9000 of beam spans for the approaches.

5647 tons, bridge, State Thruway Authority, Oneida county, New York, bids May 7.

1980 tons, State Thruway bridge, Orange and Ulster counties, New York, bids May 7.

1192 tons, section, Major Deegan expressway, in connection with State thruway, Bronx county, New York, bids May 7.

900 tons, state highway bridge, near Annapolis, Md., bids May 12.

575 tons, Washington state Skagit river swing bridge; general contract to Guy F. Atkinson Co., Seattle, low $1,033,464.

500 tons, apartment, Moore & Lopier, 4 East 89th street, New York, bids asked.

160 tons, warehouse and salesroom in Cleveland for Sylvania Electric Products, Inc. Williamsport, Pa., bids closed.

110 tons, bridge, Portland, Me., bids in.

Unstated, three radial gate hoists, Tiber dam spillway, Montana; bids to Denver May 14; Spec. DS 3931.

Unstated, eight highway bridges, Richardson Highway, Alaska; Morrison-Knudsen Co. Seattle, low $243,686; steel government-furnished.

Unstated, radial gate hoists, Savage Rapids dam; bids to Denver May 14; Spec. DS 3936

Unstated, three steel frame sections, addition to Hanford utility; bids to Atomic Energy Commission, Richland, Wash., May 14.

REINFORCING BARS . . .

REINFORCING BARS PLACED

850 tons, Elmendorf Field, Alaska, power plant, to Northwest Steel Rolling Mills Inc. Seattle; Patti-MacDonald Co., general contractor.

REINFORCING BARS PENDING

250 tons, bridge, Portland, Me., bids in.

127 tons, Garden State parkway, contract 94 section 11, Atlantic county, New Jersey bids May 11.

115 tons, three bridges, Douglas county, Oregon; bids to the Bureau of Public Roads Portland, Oreg., May 7.

101 tons, bridge work, contract 26, section 7 Garden State parkway, Monmouth county New Jersey, bids to be opened by the State Highway Authority, May 7.

Unstated, highway bridges, Oregon state; following awards by State Highway Commission: Douglas county, three concrete spans to Tom Lillebo, Reedsport, $99,655, also concrete and steel truss, North Umpqua river, Douglas county, to same contractor $166,515; Douglas county, four concrete via ducts to Glen Snook, Eugene, $100,477 Douglas county, overcrossing, to Hamilton & Thomas, Eugene, $92,560.

PLATES . . .

PLATES PENDING

Unstated, 3680 feet 24-inch welded steel waterline; bids in to C. F. Christian, city clerk Port Townsend, Wash.

PIPE . . .

CAST IRON PIPE PLACED

385 tons, 8-inch, Springfield, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

275 tons, 16-inch and under, West Springfield, Mass., to R. D. Wood Co., Florence N. J.

200 tons, 8 and 12-inch, Arlington, Mass., to Warren Pipe Co., Everett, Mass.

175 tons, 6 and 8-inch, Pittsfield, Mass., to Warren Pipe Co., Everett, Mass.

125 tons, 6 and 8-inch, Westfield, Mass., to Warren Pipe Co., Everett, Mass.

STEEL PIPE PLACED

500 tons (estimated) 16,000 feet 24 and 12-inch water mains; to Waterworks Supply Co., Portland, Oreg., by Walla Walla, Wash.

RAILS, CARS . . .

RAILROAD CARS PLACED

Gulf, Mobile & Ohio, three-hundred 95-ton ore cars to the Birmingham shops of Pullman-Standard Car & Mfg. Co., Chicago.

Louisville & Nashville, two-hundred-fifty 95-ton ore cars, to the Birmingham shops of Pullman-Standard Car & Mfg. Co., Chicago

CABLE . . .

CABLE PENDING

8500 tons, aluminum cable; Reynolds Metals Co., Louisville, Ky., low $4,339,066, prime bid f.o.b. destination; alternate, Aluminum Co. of America, $4,078,784, f.o.b. shipping point, to Bonneville Power Administration Portland, Oreg.

Advertising Index

Aetna-Standard Engineering Co., The ..... Inside Front Cover
Allegheny Ludlum Steel Corporation 26
Allis-Chalmers 11
Aluminum Import Corporation 30
American Chain & Cable, Page Steel & Wire Division 181
American Chemical Paint Co. 95
American Roller Die Corporation 124
American Shear Knife Co. 174
American Steel & Wire Division, United States Steel Corporation 32, 33
American Zinc, Lead & Smelting Co. 161
American Zinc Sales Co. 161
Applied Research Laboratories 90
Associated Spring Corporation 8
"Automatic" Sprinkler Corporation of America 151
Avondale Marine Ways, Inc. 180

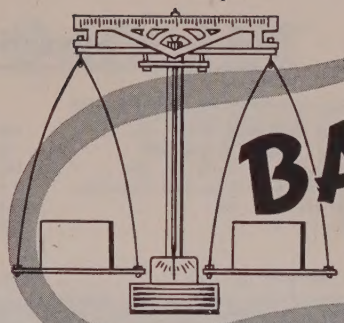
Babcock & Wilcox Co., The, Refractories Division 131
Barnes-Gibson-Raymond, Division of Associated Spring Corporation 8
Barnes, Wallace, Co., Division of Associated Spring Corporation 8
Barnes, Wallace, Co., Ltd., The, Division of Associated Spring Corporation 8
Belmont Iron Works, The 180
Bethlehem Steel Co. 1
B-G-R Cook Plant, Division of Associated Spring Corporation 8
Birdsboro Steel Foundry & Machine Co. ... 155
Bixby, R. W., Inc. 189
Blaw-Knox Co., Pittsburgh Rolls Division 27
Bliss, E. W., Co. 21
Buffalo Forge Co. 120
Builders Structural Steel Corporation 86

Carpenter Steel Co., The 45
Century Electric Co. 87
Chain Belt Co. 173
Cincinnati Machinery Co., Inc. 188
Cincinnati Milling Machine Co., The 65
Cincinnati Shaper Co., The 13
Cities Service Oil Co. 145
Clark Bros. Co. Division, Dresser Industries Inc. 36, 37
Cleveland Crane & Engineering Co., The ... 119
Cleveland Steel Tool Co., The 184
Clinton Machine Co., Metalmaster Division .. 34
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division 125
Columbia-Geneva Steel Division, United States Steel Corporation 32, 33
Commercial Contracting Corporation 6
Cone-Drive Gears Division, Michigan Tool Co. 94
Continental Steel Corporation 109
Cowles Tool Co. 180
Crocker-Wheeler Division, Elliott Co. ..122, 123
Cross Co., The 79
Crucible Steel Company of America 91

Delco Products Division of General Motors Corporation 14
Dempster Brothers 112, 113
Detroit Broach Co. 98
DoAll Co., The 138, 139
Dresser Industries, Inc. 36, 37
Dresser Manufacturing Division, Dresser Industries, Inc. 36, 37
Dunbar Brothers Co., Division of Associated Spring Corporation 8

Eastern Machine Screw Corporation, The .. 184
Eastman Kodak Co., Industrial Optical Division 105
Easton Car & Construction Co. 170
Electric Equipment Co. 188
Elliott Co. 122, 123
Emhart Mfg. Co., Henry & Wright Division .. 171
Enterprise Galvanizing Co. 182
Euclid Crane & Hoist Co., The 148

Continued on following page



BALANCED FOR EASY WHEELING!

Equipped with steel wheel or wheel with zero pressure or pneumatic tire.

You'll find it so easy to wheel heavy loads in Sterling Barrows. Only a minimum of effort is required. Sterling's perfectly balanced construction permits 80% of the load to be carried on the wheel . . . only 20% by the operator. This increases efficiency . . . allows more loads to be hauled each day . . . reduces hauling costs.

ORDER NOW!

DEALER PLAN AVAILABLE. WRITE FOR DETAILS.

Model C5W with Pneumatic Tired Wheel and Wood Frame.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

A 6026-⅓-R2

"New Process"

Punches • Dies • Rivet Sets
Compression Riveter Dies

Made of highest standards and uniform quality thus insuring maximum service.

Since 1903

Large inventory of stock sizes of round punches and dies also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Write Dept. A for Catalog 46

GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL STREET · CHICAGO 8, ILLINOIS

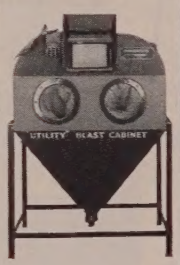
PANGBORN
BLAST CLEANING
GIVES YOU FASTER, CHEAPER MAINTENANCE

Either a Portable Unit to Clean Structures...

Pangborn Blast Cleaning Machine—Cleans tanks, bridges, buildings, and other structures quickly and economically. Ideal for maintenance and other jobs, such as removal of dirt, scale, rust, etc. preparatory to painting. Six sizes, stationary or portable, from . . . **$187** and up.

Or a Compact Cabinet for Small Pieces

Pangborn Blast Cabinet—Saves time and money in cleaning small metal parts . . . removing rust, scale, grime, old paint, etc. Produces smooth, clean surfaces on pieces up to 60″ x 35″ in size. Models from . . . **$319** and up.



Pangborn Unit Dust Collectors—Trap dust at the source. Minimize maintenance, allow reclamation of valuable material . . . **$286** and up.

Pangborn Hydro-Finish Cabinets—Remove directional grinding lines, hold tolerances to .0001″. Reduce further finishing of tools, molds, dies . . . **$1410** and up.

Write for details on these machines to: PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment.

Pangborn

BLAST CLEANS CHEAPER

Advertising Index

Concluded from preceding page

Federal Machine & Welder Co., The 108
Federal Products Corporation 12
Ferry Cap & Set Screw Co., The 168
Foote Bros. Gear & Machine Corporation 9
Foster, Frank B., Inc. 188
Foster, L. B., Co. 188

Gas Machinery Co., The 146
Gibson, William D., Co., The, Division of Associated Spring Corporation 8
Globe Brick Co., The 154
Globe Steel Tubes Co. 142
Gray Iron Founders' Society, Inc. 167
Great Lakes Steel Corporation 68
Grip Nut Co. 128

Helical Tube Corporation 183
Henry & Wright Division of Emhart Mfg. Co. 171
Hevi Duty Electric Co. 88, 89
Horsburgh & Scott Co., The 134
Hubbard, M. D., Spring Co. 184
Hydropress, Inc. 129

Ideco Division, Dresser Industries, Inc. . 36, 37
Industrial Brownhoist Corporation 143
Ingalls Iron Works Co., The 41
Inland Steel Co. 46
International Nickel Co., Inc., The 42
Iron & Steel Products, Inc. 189

Johns-Manville 35
Joliet Wrought Washer Co. 148
Jones & Laughlin Steel Corporation 149

Kearney & Trecker Corporation 81
Kennametal, Inc. 127
Keystone Steel & Wire Co. 10
Kobe, Inc. Division, Dresser Industries, Inc. 36, 37
Kold-Hold Manufacturing Co., Platecoil Division 114

Lamson & Sessions Co., The 153
Lavallee & Ide, Inc. 75
Leake Engineering Co., The 150
Lebanon Steel Foundry 172
Lee, K. O., Co. 182
Link-Belt Co. 182
Littell, F. J., Machine Co. 174
Littleford Bros., Inc. 147
Luria Brothers & Co., Inc. 187

McKee, Arthur G., & Co. 96, 97

Magnet Cove Barium Corporation 36, 37
Manross, F. N., & Sons Co., Division of Associated Spring Corporation 8
Marchant, Geo. F., Co. 191
Master Electric Co., The 107
Master Products Co., The 170
Mathews Conveyer Co. 190
Mesta Machine Co. 66
Metalmaster Division of Clinton Machine Co. 34
Michigan Tool Co., Cone-Drive Gears Division 94
Milwaukee Division of Associated Spring Corporation 8
Minneapolis-Honeywell Regulator Co., Industrial Division 19
Monarch Machine Tool Co., The 93
Motch & Merryweather Machinery Co., The .. 18

National Automatic Tool Co., Inc. 23
National-Standard Co., Reynolds Wire Division 132
National Steel Corporation 68
New Jersey Zinc Co., The 71
Nilson, A. H., Machine Co., The 117

Ohio Crankshaft Co., The 2
Ohio Division of Associated Spring Corporation 8
Ohio Locomotive Crane Co., The 184
Ohio Seamless Tube Co., The 176
O'Neil-Irwin Manufacturing Co. 16
Orban, Kurt, Co., Inc. 25
Osborn Manufacturing Co., The 3
Ottawa Steel Products, Inc. 185
Owen Bucket Co., The 184

Pacific Pumps, Inc. 36, 37
Page Steel & Wire Division, American Chain & Cable 181
Pangborn Corporation 192
Pittsburgh Gear Co. 92
Pittsburgh Rolls Division, Blaw-Knox Co. .. 27
Potter & Johnston Co., Subsidiary of Pratt & Whitney Division Niles-Bement-Pond Co. 82

Raymond Manufacturing Co., Division of Associated Spring Corporation 8
Reliance Electric & Engineering Co. 5
Republic Steel Corporation 22, 156
Reynolds Wire Division, National-Standard Co. 132
Ridgway Division, Elliott Co. 122, 123
Rockford Machine Tool Co. 136
Roebling's, John A., Sons Corporation 17
Roots-Connersville Blower Division, Dresser Industries, Inc. 36, 37
Russell, Burdsall & Ward Bolt & Nut Co. .. 72
Rust Furnace Co. 85
Ryerson, Joseph T., & Son, Inc. 38

Seaboard Coil Spring Division of Associated Spring Corporation 8
Security Engineering Division, Dresser Industries, Inc. 36, 37
Security Locknut Corporation 137
Sharon Steel Corporation 7
Signode Steel Strapping Co. 177
Simonds Saw & Steel Co. 24
SKF Industries, Inc. 126
Standard Oil Co. (Indiana) 29
Sterling Wheelbarrow Co. 191
Streeter-Amet Co. 180
Sun Oil Co. 76

Tennessee Coal & Iron Division, United States Steel Corporation 32, 33
Tennessee Products & Chemical Corporation 4
Timken Roller Bearing Co., The .. Back Cover
Towmotor Corporation 144

Upson-Walton Co., The 183
United States Steel Corp., Subsidiaries 32, 33, 110
United States Steel Export Co. 32, 33
United States Steel Supply Division, United States Steel Corporation 110

Ward Steel Co. 183
Washburn Wire Co. 20
Webb Corporation, The 184
Wheland Co., The 15
Whitehead Stamping Co. 182
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 12
Willson Products, Inc. 152
Wilson, Lee, Engineering Co., Inc. ..... Inside Back Cover

Yale & Towne Manufacturing Co. 13
Yoder Co., The 3
Youngstown Foundry & Machine Co., The .. 2

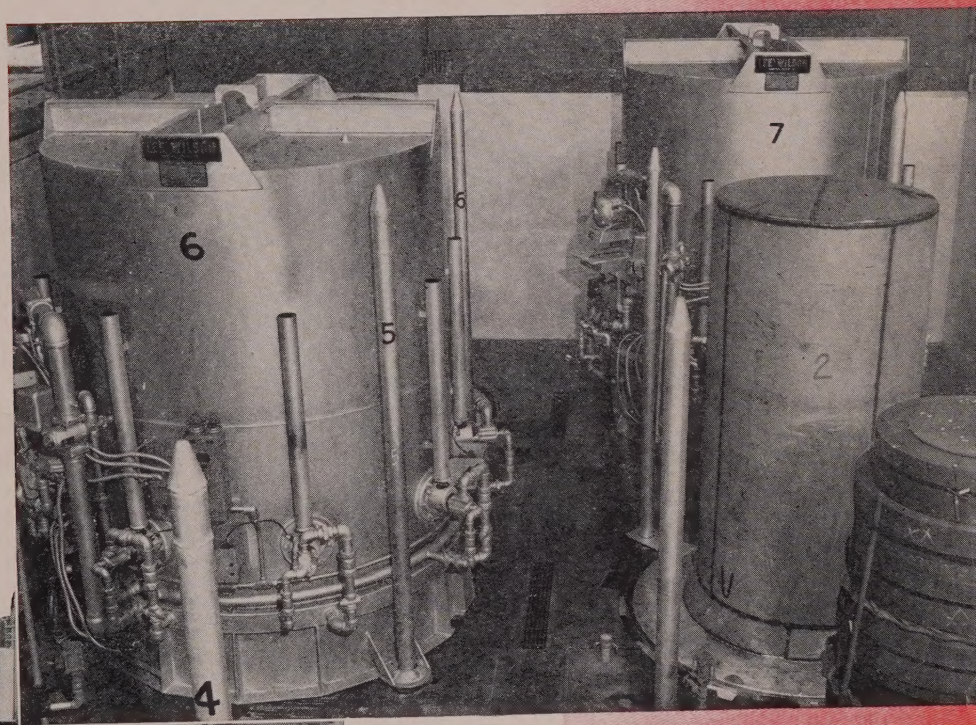
Zeh & Hahnemann Co. 184

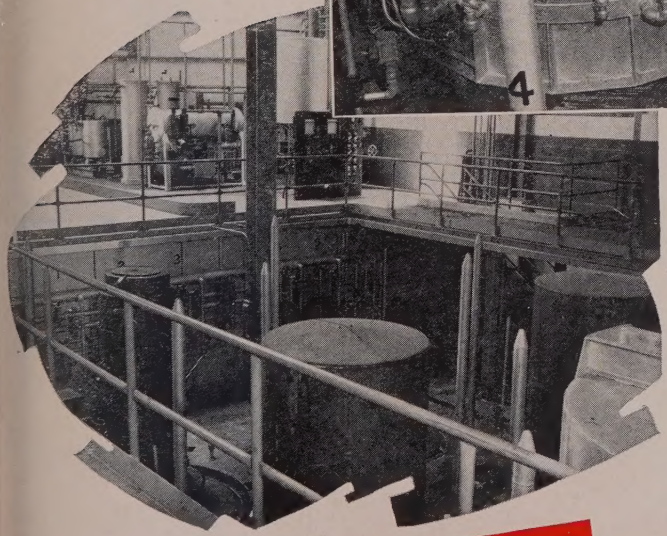
~ ~ ~

Table of Contents, Page 5

Classified Advertising Pages 188, 189

WILSON RADIANT CONVECTOR FURNACES





The recent expansion in the high carbon strip department of John A. Roebling's Sons Corporation, Trenton, New Jersey, includes this installation of Wilson radiant convector furnaces. It is comprised of two furnaces and six bases for a charge size 42" diameter x 102" piling height. New performance records for fast and uniform heating of coils for spheroidization are being established by this equipment.

Lee Wilson

ENGINEERING Co., Inc.

20005 WEST LAKE ROAD • CLEVELAND, OHIO
Telephone ED-1-6600

BELL TYPE FURNACES ★ RADIANT TUBE HEATING ★ ANNEALING PROCESSES

High precision slitter cuts .001" gage steel . . . *with help of TIMKEN® bearings*

TO INSURE the high precision needed to accurately cut .001" gage silicon steel, the Herr Engineering Company mounts the arbors of its multiple rotary slitter on Timken® tapered roller precision bearings. R. W. Herr reports: ". . . our main selling point on this piece of equipment is the high precision Timken bearings on the arbors which permit it to handle extremely thin material."

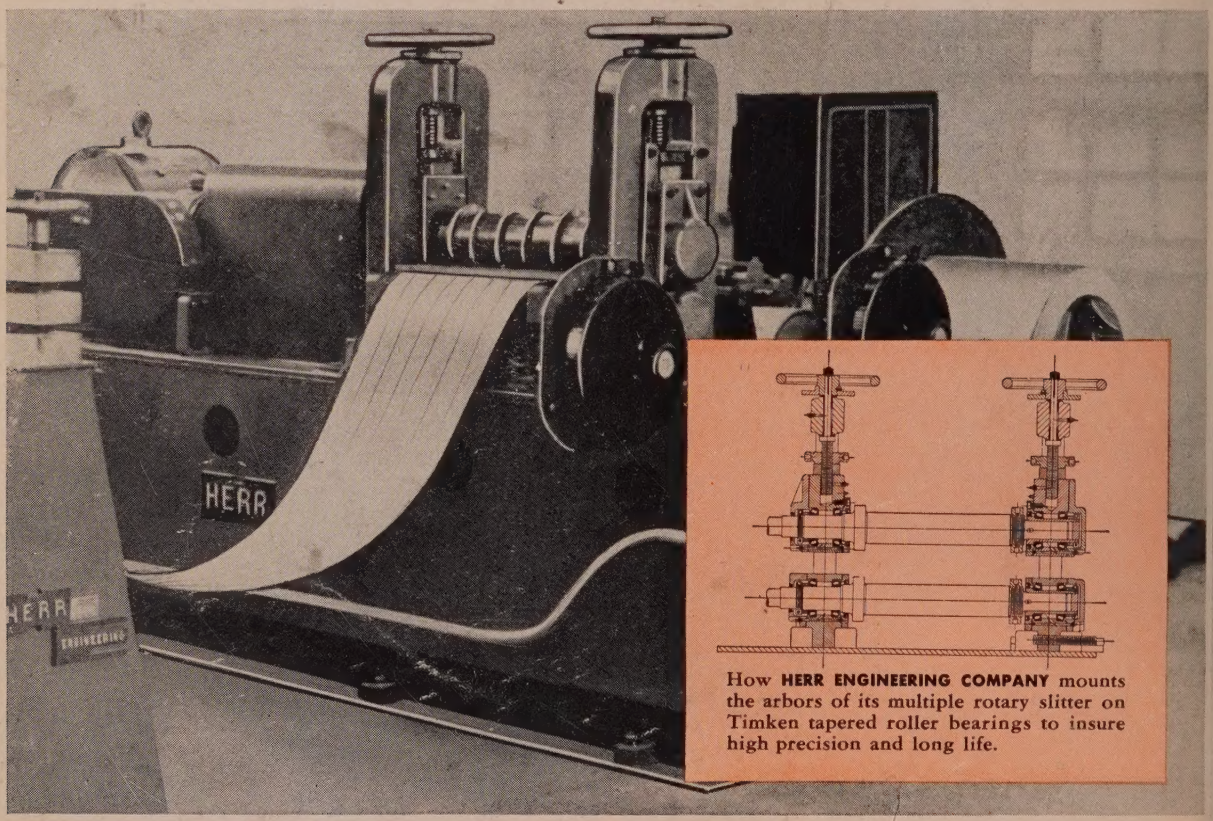
Because of their tapered construction, Timken bearings take radial and thrust loads in *any* combination. Line contact between rollers and races gives them extra load-carrying capacity. And with precision Timken bearings, the arbors have a minimum run-out, assuring precision slitting.

The true rolling motion and incredibly smooth finish of Timken bearings reduce friction to a minimum. They hold shafts and housings concentric, making closures more effective. Lubricant stays in—dirt and moisture stay out.

Timken bearings normally last the life of the machine. They're precision manufactured, engineered for the job and made of special analysis Timken fine alloy steel.

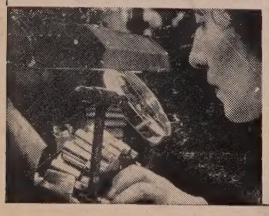
No other bearing can give you all the advantages you get with Timken tapered roller bearings. Specify them in the machines you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO."

This symbol on a product means its bearings are the best.



How **HERR ENGINEERING COMPANY** mounts the arbors of its multiple rotary slitter on Timken tapered roller bearings to insure high precision and long life.

MAGNIFYING GLASS INSPECTION OF EVERY ROLLER!

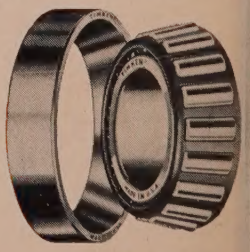


Every one of the over one billion Timken bearing rollers produced every year is inspected with powerful magnifying glasses to detect surface flaws. It's just one example of how the Timken Company insures uniform high quality.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION →◎←